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Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana's National Health Insurance Scheme

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Manuscripts

Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana’s National Health Insurance Scheme

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5 **Author contributions:** All authors were involved in study design, interpretation of data and contributed
6 to drafting of article. All authors had access to the data. TP and EV wrote the first draft of the manuscript
7 and all authors critically reviewed the manuscript and contributed to writing the final draft. EV carried out
8 statistical analysis, and EV, GA, CA, and TP contributed to modelling and interpretation of statistical
9 analyses. MdM and CB conducted qualitative analysis. All authors approved the final version.

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Abstract

Objectives: To understand the impact of integrating a fee waiver for the National Health Insurance Scheme (NHIS) with Ghana’s Livelihood Empowerment Against Poverty (LEAP) 1000 cash transfer program on health insurance enrolment.

Setting: Five districts implementing Ghana’s LEAP 1000 program in Northern and Upper East Regions.

Participants: Women, from LEAP households, who were pregnant or had a child under one year and who participated in baseline and 24-month surveys (2,497).

Intervention: LEAP provides bimonthly cash payments combined with a premium waiver for enrolment in NHIS to extremely poor households with orphans and vulnerable children, elderly with no productive capacity, persons with severe disability. LEAP 1000, the focus of the current evaluation, expanded eligibility in 2015 to those households with a pregnant woman or child under the age of 12 months. Over the course of the study households received 13 payments.

Primary and secondary outcome measures: Primary outcomes included current and ever enrolment in NHIS. Secondary outcomes include reasons for not enrolling in NHIS. We conducted a mixed-methods impact evaluation using a quasi-experimental design and estimated intent-to-treat impacts on health insurance enrolment among children and adults. Longitudinal qualitative interviews were conducted with an embedded cohort of 20 women and analyzed using systematic thematic coding.

Results: Current enrolment increased among the treatment group from 37.4% to 42.9% (n=5,523) and decreased among the comparison group from 37.3% to 28.9% (n=4,804), resulting in program impacts of 14 (95% CI: 7.8, 20.5) to 15 (95% CI: 10.6, 18.5) percentage points for current NHIS enrolment. Common reasons for not enrolling were fees and travel.

Conclusion: While impacts on NHIS enrolment were large, gaps remain to maximize the potential of integrated programming. NHIS and LEAP could be better streamlined to ensure poor households fully benefit from both services, in a further step towards integrated social protection.

Trial registration: This study is registered in the International Initiative for Impact Evaluation’s (3ie) Registry for International Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

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Competing interests: The authors declare no competing interests.

Article summary

Integrated cash transfer programmes, combining cash with complementary interventions or facilitating access to services, are on the rise in sub Saharan Africa to improve health and development impacts, but there is limited evidence on effectiveness. Studies from Latin America have demonstrated increased uptake of health services among transfer recipients but few studies have examined health insurance uptake as a result of integrated, governmental programmes aimed at poverty reduction.

Strengths and limitations of this study

- This is the first study to assess the impact of an integrated government programme providing cash transfers combined with a fee waiver for a national health insurance scheme on health insurance uptake.
- We use a quasi-experimental, longitudinal, mixed-method study design to examine causal impacts of the intervention on health insurance enrolment.
- This study demonstrates that while integration of cash transfers with a fee waiver for health insurance can increase the enrolment, there is a need to improve communication about the integrated programming among all stakeholders.
- A limitation of the study design is that it estimates local average treatment effects, and thus program effects may be larger for individuals in poorer households, further from the proxy means test cut-off used in our sampling criteria, as compared to impacts estimated in this study.

INTRODUCTION

Poverty is a determinant of poor health and reduced access to health care, compounding the former. Increasingly, social protection programs are being implemented globally to reduce poverty and promote increased investment in human capital development, including health.⁽¹⁾ A common social protection program is cash transfers, which entail direct provision to cash to beneficiary households. Robust evidence demonstrates impacts of cash transfer programs on poverty reduction, food security, and increased healthcare expenditure and utilization.⁽²⁻⁵⁾ Existing literature comes largely from Latin America, where cash transfer programs tend to be conditional on health check-ups and other “co-responsibilities,” whereas African programs are largely unconditional, meaning there are no behavioral requirements to maintaining eligibility. Impacts on health-related outcomes may vary based on context and program design.

To mitigate the impact of poverty on health, additional programs or linkages to services are needed. Linking cash transfers with health insurance is an example of integrated social protection programming (often referred to as “cash plus”).⁽⁶⁾ While one study showed that subsidies effectively promoted enrolment and renewal of NHIS,⁽¹⁰⁾ the question of whether a large-scale government-run cash transfer program linked with fee waivers can induce beneficiaries to enroll in health insurance has not been examined.

In the past 15 years, the Government of Ghana has implemented two major policy initiatives to address the intersection of poverty and health. In 2003, government passed the National Health Insurance Act (Act 650) and established a National Health Insurance Authority (NHIA). Implementation of the National Health Insurance Scheme (NHIS) began in 2004. The NHIS aims to remove cost barriers to accessing care and covers out-patient and in-patient services, dental services, and maternal health services. The NHIA actively seeks out opportunities to enroll poor and vulnerable persons onto the scheme, as illustrated by their program goals and targeted outreach to enroll members under the ‘indigent’ exemption.⁽⁷⁾ By 2014, coverage was estimated at approximately 40% of the population.⁽⁸⁾ Despite

considerable progress in uptake, significant gaps remain, including limited knowledge of the scheme's services and conditions, long waiting times, and inadequate staffing of health workers, limiting access among the poorest and most marginalized populations.⁽⁸⁾

In a second major initiative to address extreme poverty, the Ministry of Gender, Children and Social Protection (MoGCSP) launched a large-scale social protection program, the Livelihoods Empowerment Against Poverty (LEAP) in 2008. LEAP provides bimonthly cash payments to extremely poor households with orphans and vulnerable children, elderly with no productive capacity, persons with severe disability, and, starting in 2015, those with a pregnant woman or child under the age of 12 months. As of December 2017, LEAP reached more than 213,000 extremely poor families in all 216 districts of Ghana. In a step towards better integration of social protection programming, the NHIA and the MoGCSP collaborated in 2011 to enroll LEAP beneficiaries into NHIS, qualifying under the NHIA "indigent" exemption which waives all NHIS fees, including those for card processing, premiums and renewals.

We assessed the impact of the integration of cash and fee waivers in LEAP 1000 on enrolment in the NHIS, a first step in reducing barriers to health access.

METHODS

Study setting and design

Data come from the impact evaluation of the Ghana LEAP 1000 pilot program.⁽⁹⁾ This pilot added a fourth eligibility category to Ghana's LEAP program, namely that of poor families with pregnant women or infants under one year old, aiming to reach poor children in the first 1000 days of their lives to improve nutrition and developmentⁱ. Now integrated into the LEAP program nationally, LEAP 1000 was first piloted in ten districts in northern Ghana. The longitudinal, mixed-methods evaluation was carried out by UNICEF Office of Research – Innocenti, the University of North Carolina at Chapel Hill (UNC-CH), the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana, and Navrongo Health Research Center (NHRC) and covered five of the original ten LEAP 1000 pilot districts

(Yendi, Karaga, East Mamprusi in the Northern Region and Bongo and Garu Tempane in the Upper East Region). These districts were purposively selected to reflect demographic diversity in the pilot. To identify a comparison group, the evaluation exploited the program eligibility score (proxy means test, PMT) used in the targeting phase to identify eligible participants and collected data only on those households close to the cut-off for maximum comparability. This design is inspired by the regression continuity approach which focuses on observations near the cut-off to mimic a randomized control trial.⁽¹⁰⁾ Satisfaction of RDD-related assumptions was documented in the baseline evaluation reportⁱⁱ.⁽¹¹⁾

The PMT includes assets, dwelling characteristics, household size, etc. The threshold for program eligibility was determined by the government after PMT data was collected based on the budget available to enroll approximately 6,000 households to receive transfers for at least three years. Households falling below the cut-off, those classified as extremely poor by the PMT, were enrolled in the program. The study was powered to detect program impacts on child health and nutrition outcomes, with an estimated required sample size of 2,500 households, half from the comparison group (above the PMT cut-off) and half from the treatment group (below the PMT cut-off). The baseline survey was conducted in July-September 2015 with 2,497 women that were pregnant at the time of the targeting exercise or had a child under 15 months of age. Of these households, 2,331 were re-interviewed at endline (implemented between June and August 2017).

The qualitative component of the evaluation included in-depth interviews a cohort of 20 beneficiary women from the treatment arm at baseline, 12 and 24-months' follow-up. Male partners of beneficiaries were interviewed during the 12 and 24-month follow-up visits. The purposive sample of the embedded cohort focused on geographic location (remote v. closer to markets) and parity (first time mother vs women with 3+ children) to facilitate comparative analysis.

Ethics review and study registration

1 The quantitative component was reviewed by the Ethics Committee for the Humanities of the University
2 of Ghana and the qualitative component by the Institutional Review Boards at UNC-CH and NHRC. The
3 trial is registered in the International Initiative for Impact Evaluation's (3ie) Registry for International
4 Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

5 **Patient and Public Involvement statement**

6 Patients were not involved in this study. The development of the initiative being evaluated, research
7 questions and outcome measures were informed by a vulnerability analysis which indicated that
8 marginalized populations eligible for premium fee waivers under the NHIS were often not enrolling in the
9 scheme. Research findings from the larger impact evaluation were disseminated in March 2019 to
10 national policymakers and stakeholders, including district welfare officers, who liaise directly with
11 program participants.

12 **Measures**

13 Primary outcomes included current and ever enrolment in NHIS. For household member aged five years
14 and above, a series of questions were asked to the main survey respondent, including whether the
15 individual was covered under any health insurance scheme (NHIS was a response option). Then
16 respondents were asked if the individual had ever been enrolled in NHIS (endline only) and whether the
17 individual currently had a valid NHIS card. Analyzing ever enrolment allowed us to further disaggregate
18 those that were not enrolled at endline into those never enrolled and those previously enrolled but not
19 currently holding a valid NHIS card at endline.

20 For those not enrolled, we examined reasons why, including premium was too expensive, respondent did
21 not realize the card expired, travel time or related cost was too high, lack of awareness that card must be
22 renewed annually, respondent had not been sick, waiting times at renewal location are too long, perceived
23 poor quality of NHIS/preferred services not covered, NHIS office was closed, and other reasons.

24 Qualitative interviews elicited narratives of program impact within each household and context to
25 facilitate interpretation, probing specifically on enrollment and renewal in NHIS. We used a semi-

structured guide, audio-recorded and transcribed verbatim and translated all interviews. All interviewers and participants were matched on gender and local language preference.

Statistical analyses

Our analytic sample included individuals who were interviewed both at baseline and endline, and we stratified analyses by age: children aged 5 – 15 at baseline and adults aged 16 and above at baseline and thus aged 18 years and above by endline.

We examined balance among background characteristics and outcomes at baseline between treatment and comparison individuals. Then we investigated if attriters differed in background characteristics by treatment status (differential attrition), which could threaten internal validity and unbiasedness of our estimates.

Next, we conducted bivariate analyses to examine background characteristics associated with enrolment status, controlling for PMT score. Categories of enrolment in NHIS included: 1) currently enrolled, 2) currently not enrolled but previously enrolled (ever) and 3) never enrolled.

Because the study’s quasi-experimental design exploited the PMT score cut-off for program eligibility and sampled those near the cut-off, these estimates are local average treatment effects.

To estimate treatment impacts of LEAP 1000 on NHIS enrolment, we utilized a difference-in-differences (DID) approach as specified in equation 1.

$$Y_{ijt} = \beta_0 + \beta_1 P_{ij} + \beta_2 T_t + \beta_3 P_{ij} * T_t + \beta_4 X_{ijt} + \lambda_j + \varepsilon_{ijt} \tag{1}$$

Where Y_{ijt} is a binary variable indicating whether individual i residing in community j is enrolled in NHIS in year t . P_{ij} is a dummy indicator for individual’s i participation into LEAP 1000, equal to 1 if his or her household is assigned to treatment and 0 otherwise. T_t is a time binary variable, set to 1 if the observation is from the endline survey, and to 0 if it is from the baseline. $P_{ij} * T_t$ is the interaction term between the program and time dummies. X_{ijt} includes a set of observed individual (gender, age and age squared in years) and household characteristics [age, gender and education (no formal education versus some

education) of the household head; household size and PMT score]. The model also controls for community fixed effects, λ_j , to absorb unobserved-time invariant characteristics of communities. β_3 is the intent-to-treat (ITT) impact estimate. Standard errors were clustered at the community level. A key assumption in the DID estimation model is that treatment and comparison groups experience parallel trends over time, and this holds in the current study as both study arms were sampled from the same communities.

For the qualitative analysis, we first developed a longitudinal summary for each household, integrating women's and men's interviews when both were available, to capture the story of impact over time. We summarized patterns in enrollment and renewals across household members and coded for topics related to NHIS using Atlas.ti software.

RESULTS

At baseline, data for 4,736 children and 6,865 adults were reported, while at endline 4,197 and 6,130 of these children and adults, respectively, remained part of the sample households (11% overall attrition for both age groups; Figure A1 and Table A1 in Appendix). Attrition rates were similar between study arms, and attrition by background characteristics and outcomes did not vary between groups (Table A2 in Appendix).

[Table 1 approximately here]

The child sample was 46.6 percent female, and average age was 8.9 years (SD=2.9), while the adult sample was 56.3 percent female, and average age was 36.7 years (SD=15.2). Average household size was 7.6 members (SD=3.0), and 6 percent of households had female heads. Further, 81.9 percent of heads had no formal education (figures comprise averages calculated from values in Columns 2 and 5, Appendix 2). Over the study period, NHIS enrolment increased among the treatment group from 36.1

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1 percent to 45.7 percent and decreased among the comparison group from 36.6 percent to 33.3 percent
2 (Figures 1 and 2).

3 In bivariate analyses (Table 1), characteristics positively associated with enrolment included younger age
4 (current and ever), female (current and ever), higher head education levels (current and ever), female
5 headship (current and ever), smaller households (current and ever), and Karaga district (ever). There were
6 no differences in enrolment by extreme poverty status.

7 [Table 2 approximately here]
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9 Among those previously enrolled but not currently enrolled at endline, the most commonly reported
10 reasons were enrolment fee/premium was too expensive (75.32 percent; Table 2), not realizing card
11 expired (11.36 percent), and travel time/travel cost was too high (9.28 percent). Qualitative interviews
12 identified barriers to renewal including long wait times, competing demands with work, cost of transport,
13 and poor road conditions. Cost was also a salient barrier, reflecting both extreme poverty as well as
14 confusion about their NHIS fee exemption status. As a male participant in Bongo stated simply, “*That*
15 *money (the transfer) is not even enough to register for the children and the woman.*”

16 Reasons for never enrolment were similar: 65.44 percent reported enrolment fee/premium too expensive,
17 14.94 percent report travel time/travel cost too high, and another commonly reported reason was waiting
18 times (Table 2). Some participants described that the LEAP program had come to their house to take their
19 cards for renewal, eliminating some of the aforementioned barriers. Others described using their LEAP
20 cash transfer to pay for renewal and viewed LEAP as facilitating their enrolment or renewal due to the
21 cash provided by the program.

22 [Table 3 approximately here]
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24 Qualitative findings echoed the patterns from the quantitative analyses, with both women and men
25 indicating that women and children were the priority for enrolment. While perceptions of NHIS benefits

1 were generally positive, at baseline several discussed never having enrolled because they questioned the
2 quality of the coverage for not including enough services and medication. There were additional concerns
3 about the quality of care for people using NHIS versus those paying for services, as reflected by a mother
4 in Karaga at baseline,

5 *“Some people say when you visit the hospital with it the doctors don’t want to attend to you but if*
6 *you do not have one, that one they will attend to you. This is the reason why we aren’t interested*
7 *in it.”*

8 Notably, she was enrolled by the endline interview, reflecting the potential impact of the integrated
9 programming on improving acceptance and reducing enrolment barriers.

10 Impact estimates indicate that LEAP 1000 increased current NHIS enrolment by 14 (95% CI 7.83 –20.52)
11 and 15 (95% CI 10.63–18.46) percentage points for children and adults, respectively (Table 3, first two
12 columns). Further, LEAP 1000 increased the proportion of adults reporting having ever been enrolled by
13 7 (95% CI 0.97–12.80) percentage points (Table 3, last two columns). The impact on ever enrolment was
14 not significant for children.

15 Most participants reflected a positive experience or perceptions of NHIS as a way to save costs on health
16 care. Among those who had used NHIS, nearly all were satisfied and felt that having insurance had
17 helped them to save money when seeking healthcare. A mother in Karaga identified NHIS enrolment as a
18 major component of LEAP impact, which she further linked to overall poverty reduction,

19 *Now the LEAP 1000 has given us the chance to register for the NHIS and reduced the poverty*
20 *levels of mothers. It was a big problem for most mothers to get money and register for the NHIS*
21 *but now it is easy for all beneficiaries of the LEAP programme.*

22 This sentiment was echoed by other mothers who appreciated that being in LEAP had allowed them to
23 enroll and/or renew their families in NHIS and take better care of their family’s health. Some participants
24 discussed lack of medication and other supplies as a barrier to getting care even when you have insurance,

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1 reflecting health systems challenges beyond NHIS as reflected by a father in Bongo, “*You know the*
2 *insurance, when we sent the child, they gave us a prescription to buy medicine because there was no*
3 *medicine in the hospital.*”

4 Some participants mentioned that in cases like this, they could use their LEAP money to purchase
5 medication, which helped to protect their children’s health.

6 **DISCUSSION**

8 This study demonstrated that integrating government social protection program pairing cash transfers with
9 fee waivers for national health insurance enrolment increased enrolment into NHIS among both children
10 and adults. Our findings contribute to the literature on “cash plus” programs by providing evidence of the
11 impact of integrating cash with a health insurance fee waiver to increase enrolment. Virtually all studies
12 to date on this topic have looked at impacts of cash only or conditional cash transfers on morbidity and
13 use of health facilities and have found limited impact, particularly on adult morbidity.⁽²⁾ Our findings
14 highlight a potential pathway to increase the health impacts of unconditional cash transfer programs by
15 increasing access to preventive and curative healthcare services through insurance coverage. Future
16 research should investigate the how integrated cash plus programs can achieve impact on health outcomes
17 beyond access to care, including morbidity, mortality and mental health.

18 While impacts on enrolment were considerably large, enrolment gaps remain, particularly for adults. The
19 salience of cost as a perceived barrier to enrolment reflects insufficient communication or
20 misunderstanding of the integration of the fee waiver with LEAP and highlights the need to improve
21 communication with both program participants and implementers to maximize the potential impact of this
22 integration and protect against beneficiaries using their transfer to purchase insurance. Additionally, even
23 with the fee waiver, the annual renewal requirement for NHIS can be difficult for poor families to comply
24 with, often leading to expiration of benefits. Such gaps demonstrate operational issues within both
25 programs that could be better streamlined to ensure that eligible households fully benefit from both

1 services. Extending the validity period for NHIS beyond one year for LEAP households, thereby reducing
2 the financial and time burden for annual renewal, is one recommendation. Also, data systems could be
3 linked, allowing field officers to track enrolment and validity along with their routine monitoring. Finally,
4 better orientation could be provided to the NHIA workers, ensuring that they do not mistakenly charge
5 fees to exempt LEAP households.

6 One limitation of this study is that impact estimates are likely lower bounds of program impacts, given
7 the local average treatment impacts estimated among a sampled treatment group which is relatively
8 “better off” than other LEAP households further from the eligibility cut-off.

9 Findings underscore the need to improve education among beneficiaries around the annual renewal
10 requirement and exemption from paying premiums. Such findings have implications for Ghana and other
11 countries looking to integrate their cash transfer programs with access to health services, which must be
12 done not only at policy level but also with practical implementation modalities for the end user.

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ⁱ Infants under 15 months were accepted as eligible to avoid excluding children due to variations in quality of birth date data and/or the extended duration of the targeting process.

ⁱⁱ The success in the implementation of an RDD necessitates that 1) participants were not able to manipulate their PMT score, 2) the threshold is determined independently of the rating variable, and 3) no discontinuities are present other than the treatment status in baseline characteristics and outcomes.

**Table 1: Bivariate analyses of background characteristics by enrolment status, Ages 7-103 at
endline**

	Means of characteristics			P-value of difference		
	Never enrolled with NHIS	Ever enrolled but currently no valid NHIS	Currently valid NHIS	Col(1)- Col(2)	Col(1)- Col(3)	Col(2)- Col(3)
	(1)	(2)	(3)	(4)	(5)	(6)
Age	24.92	19.26	16.45	0.00	0.00	0.00
Female	0.40	0.53	0.56	0.00	0.00	0.00
Elder (Age>=70 years)	0.03	0.02	0.02	0.01	0.21	0.04
Female elder	0.02	0.01	0.01	0.15	0.74	0.19
Male elder	0.02	0.01	0.01	0.01	0.17	0.05
Household size	7.62	7.73	7.29	0.68	0.00	0.03
Educational level of head	2.40	3.81	4.31	0.00	0.14	0.00
Head no formal schooling	0.88	0.82	0.79	0.00	0.03	0.00
Head is female	0.04	0.06	0.08	0.03	0.01	0.00
Age of head	40.09	40.71	40.17	0.30	0.05	0.53
Poor	0.99	0.98	0.98	0.72	0.45	0.35
Extremely poor	0.91	0.89	0.89	0.20	0.84	0.16
Karaga district	0.40	0.21	0.12	0.00	0.01	0.00
Yendi district	0.10	0.19	0.16	0.00	0.21	0.06
Bongo district	0.07	0.12	0.19	0.00	0.00	0.00
Garu-Tempane district	0.09	0.18	0.13	0.00	0.01	0.06
N	8,378	8,035	11,695			

Source: Authors’ analysis. Notes: Mean values represent unadjusted statistics. P-values in Columns 4,5,6 correspond to the coefficient on each enrolment group from a regression predicting each characteristic listed in the table controlling for PMT score. Standard errors clustered at the community level.

**Table 2: Reasons for not renewing/never having NHIS by treatment status, Ages 7-103 at
endline**

	All	Comparison	Treatment	P-value of diff.
Ever enrolled but no valid NHIS	41.54	44.65	38.77	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	75.32	80.34	70.14	0.00
Did not realized card expired	11.36	10.61	12.14	0.54
Travel time/cost too high	9.28	8.40	10.19	0.37
Not aware had to be renewed annually	6.77	6.22	7.34	0.31
Has not been sick	1.59	1.49	1.70	0.68
Waiting time at renewal too long	3.05	1.15	5.00	0.00
Poor quality care with NHIS - preferred services not covered	0.32	0.19	0.45	0.18
NHIS office closed	0.44	0.19	0.70	0.19
Other (card lost, no time, etc.)	0.25	0.19	0.32	0.22
<i>N</i>	6,336	3,215	3,121	
Never enrolled with NHIS	18.98	22.29	16.02	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	65.44	65.28	65.64	0.92
Travel time/cost too high	14.94	17.67	11.56	0.02
Waiting time at renewal too long	4.85	4.23	5.62	0.24
Poor quality care with NHIS - preferred services not covered	3.30	2.36	4.47	0.01
Don't understand NHIS	0.28	0.19	0.39	0.39
Other	10.84	10.14	11.71	0.41
<i>N</i>	2,905	1,607	1,298	

Source: Authors' analysis. Notes: P-values are reported from Wald tests on the equality of means of Treatment and Comparison for each variable. Standard errors are clustered at the community level.

Table 3: Impact estimates of Ghana LEAP 1000 on current NHIS enrolment and ever enrolment, by age groups

	DID impact on current NHIS enrolment		OLS impact on ever NHIS enrolment	
	Ages 7-17 years at baseline	Ages 18+ years at baseline	Ages 7-17 years at baseline	Ages 18+ years at baseline
DID (Treatment X Time)	0.14 (0.03)***	0.15 (0.02)***		
Treatment	-0.01 (0.03)	0.01 (0.03)	0.05 (0.03)	0.07 (0.03)**
Time	-0.14 (0.03)***	-0.05 (0.02)**		
Age	-0.01 (0.00)***	-0.00 (0.00)***	-0.01 (0.01)	-0.00 (0.00)***
Age squared	-0.00 (0.00)**	0.00 (0.00)***	0.00 (0.00)	0.00 (0.00)**
Female	0.00 (0.01)	0.20 (0.01)***	-0.00 (0.01)	0.20 (0.01)***
PMT score	-0.02 (0.18)	0.21 (0.15)	-0.01 (0.16)	0.22 (0.18)
Household size	-0.00 (0.00)	-0.00 (0.00)*	-0.00 (0.00)	0.00 (0.00)
Head is female	-0.08 (0.03)***	-0.03 (0.02)	-0.01 (0.02)	-0.06 (0.02)**
Age of head	-0.00 (0.00)	0.00 (0.00)***	-0.00 (0.00)	0.00 (0.00)*
Head no formal schooling	-0.05 (0.03)*	-0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)
R ²	0.14	0.13	0.25	0.23
N	8,394	12,260	4,192	6,130
Baseline means	0.449	0.323		
Endline comparison means	0.311	0.276	0.832	0.746

Source: Authors' analysis. Notes: All regressions include the following covariates at baseline: Age, dummy for female (0,1), household head's age, dummy for having no formal education (0,1), dummy for women household head (0,1), PMT score, household size; community fixed effects. Impact from difference-in-difference estimates; impact on ever NHIS enrolment from single difference estimates. Analysis restricted to a panel sample. Standard errors in parenthesis clustered at the community level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$.

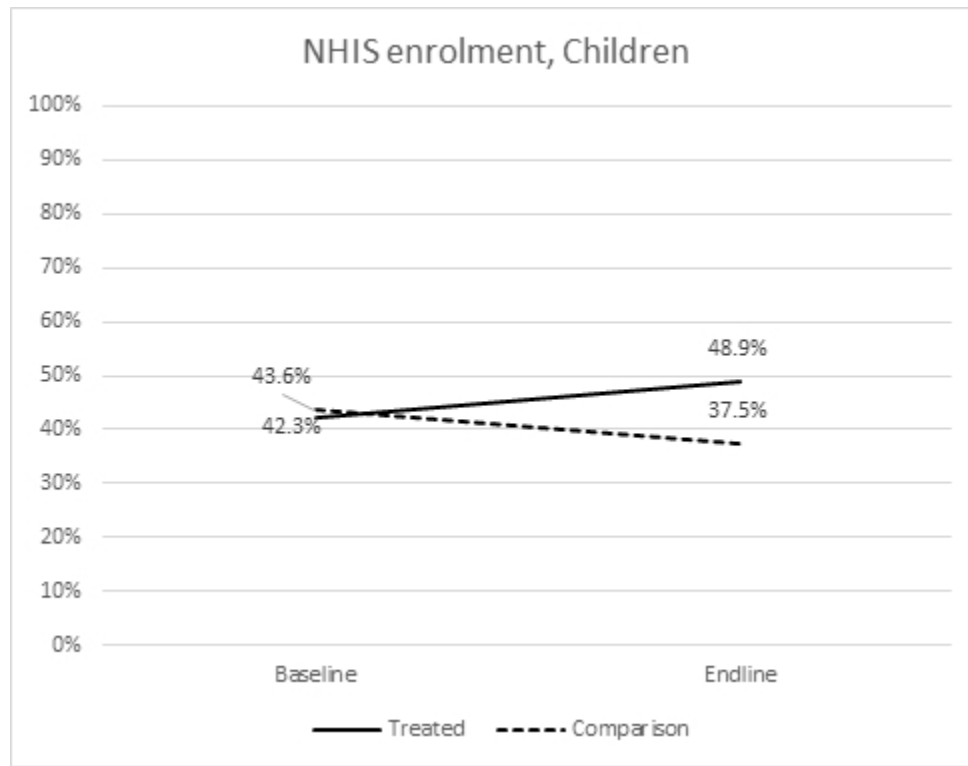


Figure 1: Proportion of children (5-17 years old) with valid NHIS card for the current year

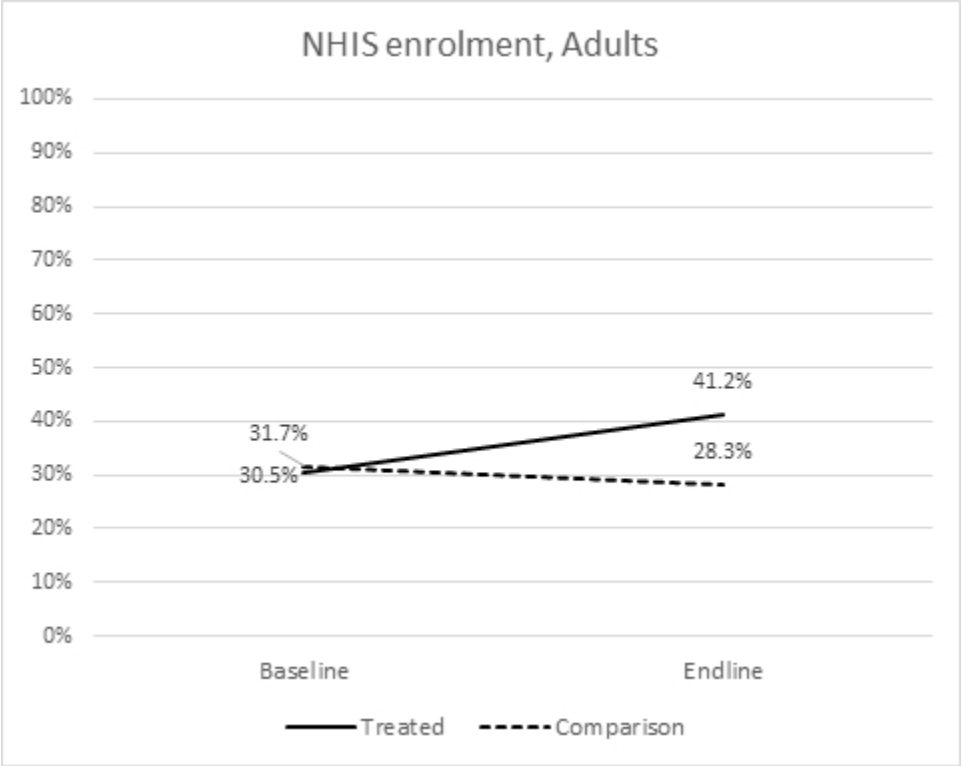


Figure 2: Proportion of adults (18+ years old) with valid NHIS card for the current year

Appendices

Figure A1: Flowchart of study sample

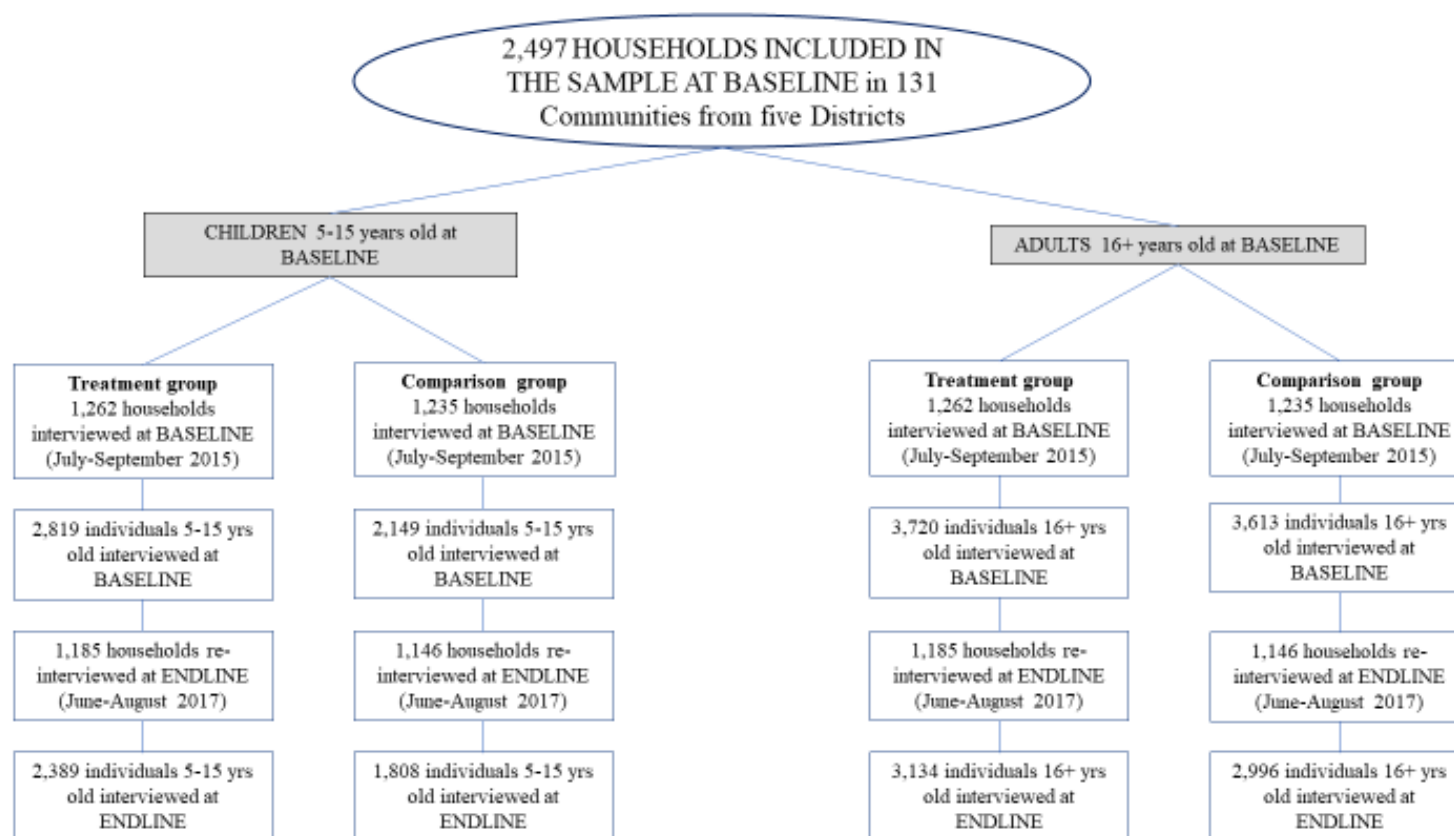


Table A1: Attrition by treatment status and age group

	N	All	Comparison	Treatment	P-value of diff.
<i>Individuals aged 5-15 years at baseline</i>					
Attrition rate	4,736	0.11	0.12	0.11	0.755
<i>Individuals aged 16+ at baseline</i>					
Attrition rate	6,865	0.11	0.11	0.11	0.989

T-test based on standard errors clustered at the community level.

Table A2: Individual differential attrition (from baseline to endline) by baseline characteristics

	Attritors	Control Panel	P-value	Attritors	Treatment Panel	P-value	Difference Col(1)-Col(4)	P-value	Balance Col(2)-Col(5)	P-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Individuals aged 5-15 years at baseline										
<i>Background characteristics</i>										
Age (years)	9.90	8.83	0.000	10.00	8.93	0.000	-0.52	0.428	0.01	0.966
Age squared	108.46	87.04	0.000	110.51	88.51	0.000	-10.83	0.424	-0.32	0.925
Female (0,1)	0.62	0.46	0.000	0.56	0.47	0.003	-0.03	0.730	-0.01	0.828
Household size	9.42	8.01	0.000	10.13	8.44	0.000	-0.14	0.881	0.29	0.461
Head is female (0,1)	0.07	0.06	0.583	0.04	0.07	0.009	0.00	0.987	0.05	0.039
Age of head (years)	43.66	41.76	0.077	45.47	42.69	0.021	2.10	0.435	-0.79	0.448
Head no formal schooling (0,1)	0.85	0.84	0.818	0.90	0.85	0.035	-0.07	0.257	0.03	0.486
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.37	0.45	0.014	0.30	0.45	0.001	0.10	0.186	0.01	0.836
N	238	1,808		301	2,389					
Individuals aged 16+ at baseline										
<i>Background characteristics</i>										
Age (years)	36.31	36.06	0.834	35.67	37.30	0.247	1.49	0.632	-0.11	0.871
Age squared	1,713.16	1,528.12	0.107	1,676.83	1,626.01	0.716	147.23	0.621	-11.17	0.863
Female (0,1)	0.54	0.56	0.454	0.56	0.56	0.957	0.05	0.375	0.01	0.311
Household size	8.43	6.88	0.000	9.31	7.57	0.000	0.11	0.887	0.32	0.184
Head is female (0,1)	0.08	0.05	0.135	0.07	0.07	0.740	-0.01	0.771	0.04	0.037
Age of head (years)	42.77	38.50	0.001	44.95	41.12	0.001	-3.71	0.163	0.32	0.754
Head no formal schooling (0,1)	0.75	0.78	0.379	0.81	0.82	0.776	-0.13	0.109	0.05	0.189
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.26	0.33	0.016	0.21	0.32	0.000	0.05	0.459	0.03	0.259
N	359	2,996		376	3,134					

Mean values represent unadjusted statistics. P-values in Column 8 are from the coefficient on treatment from a regression predicting each characteristic listed in the table controlling for PMT score, among the group of attritors, while Column 10 is the same among the panel sample. Standard errors clustered at the community level.

CHEERS checklist—Items to include when reporting economic evaluations of health interventions

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as “cost-effectiveness analysis”, and describe the interventions compared.	page 1, line 1 to 2
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	page 3, line 1 to 23
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study.	page 5, line 13-18
		Present the study question and its relevance for health policy or practice decisions.	page 6, line 13 to 14
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	page 6, line 18 to page 7, line 14; page 7, lines 21 to 23
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	page 6, line 25 to page 7, line 2
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	Page 6, line 6 to 12
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	Page 7, line 8 to 16
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	Page 7, lines 7 to 14
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	N/a
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	Page 8, lines 13 to 18
Measurement of effectiveness	11a	<i>Single study-based estimates:</i> Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	Page 9, line 15 to Page 10, line 6
	11b	<i>Synthesis-based estimates:</i> Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	N/a
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	N/a
Estimating resources and costs	13a	<i>Single study-based economic evaluation:</i> Describe approaches used to estimate resource use associated with the alternative interventions. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	N/a
	13b	<i>Model-based economic evaluation:</i> Describe	Page 9, line 15 to Page 10,

Section/item	Item No	Recommendation	Reported on page No/ line No
		approaches and data sources used to estimate resource use associated with model health states. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	line 6
Currency, price date, and conversion	14	Report the dates of the estimated resource quantities and unit costs. Describe methods for adjusting estimated unit costs to the year of reported costs if necessary. Describe methods for converting costs into a common currency base and the exchange rate.	N/a
Choice of model	15	Describe and give reasons for the specific type of decision-analytical model used. Providing a figure to show model structure is strongly recommended.	Page 9, lines 14 to 15
Assumptions	16	Describe all structural or other assumptions underpinning the decision-analytical model.	Page 10, lines 4 to 6
Analytical methods	17	Describe all analytical methods supporting the evaluation. This could include methods for dealing with skewed, missing, or censored data; extrapolation methods; methods for pooling data; approaches to validate or make adjustments (such as half cycle corrections) to a model; and methods for handling population heterogeneity and uncertainty.	Page 9, line 4 to Page 1, line 11
Study parameters	18	Report the values, ranges, references, and, if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	Tables 1-3
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	N/a
Characterising uncertainty	20a	<i>Single study-based economic evaluation:</i> Describe the effects of sampling uncertainty for the estimated incremental cost and incremental effectiveness parameters, together with the impact of methodological assumptions (such as discount rate, study perspective).	N/a
	20b	<i>Model-based economic evaluation:</i> Describe the effects on the results of uncertainty for all input parameters, and uncertainty related to the structure of the model and assumptions.	Standard errors of point estimates reported in Table 3
Characterising heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	N/a
Discussion			
Study findings, limitations, generalisability, and current knowledge	22	Summarise key study findings and describe how they support the conclusions reached. Discuss limitations and the generalisability of the findings and how the findings fit with current knowledge.	Page 13, lines 8 to 10; Page 11, lines 6 to 8
Other			

Section/item	Item No	Recommendation	Reported on page No/ line No
Source of funding	23	Describe how the study was funded and the role of the funder in the identification, design, conduct, and reporting of the analysis. Describe other non-monetary sources of support.	Page 3, lines 22 to 23
Conflicts of interest	24	Describe any potential for conflict of interest of study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors recommendations.	No conflicts of interest reported

For consistency, the CHEERS statement checklist format is based on the format of the CONSORT statement checklist

BMJ Open

Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana's National Health Insurance Scheme

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Keywords:	Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Public health < INFECTIOUS DISEASES, Economics < TROPICAL MEDICINE, cash transfers, health insurance waivers, Ghana

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Manuscripts

Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana’s National Health Insurance Scheme

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Author contributions: TP, EV, GA, MdM, CA, TS and CB were involved in study design, interpretation of data and contributed to drafting of article. TP, EV, GA, MdM, CA, TS and CB had access to the data. TP and EV wrote the first draft of the manuscript and all authors critically reviewed the manuscript and contributed to writing the final draft. EV carried out statistical analysis, and EV, GA, CA, and TP contributed to modelling and interpretation of statistical analyses. MdM and CB conducted qualitative analysis. TP, EV, GA, MdM, CA, TS and CB approved the final version. A majority of the work for this paper was completed while the corresponding author (TP) was affiliated with UNICEF Office of Research – Innocenti and she has since moved to the University at Buffalo (SUNY).

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Abstract

Objectives: To understand the impact of integrating a fee waiver for the National Health Insurance Scheme (NHIS) with Ghana’s Livelihood Empowerment Against Poverty (LEAP) 1000 cash transfer program on health insurance enrolment.

Setting: Five districts implementing Ghana’s LEAP 1000 program in Northern and Upper East Regions.

Participants: Women, from LEAP households, who were pregnant or had a child under one year and who participated in baseline and 24-month surveys (2,497).

Intervention: LEAP provides bimonthly cash payments combined with a premium waiver for enrolment in NHIS to extremely poor households with orphans and vulnerable children, elderly with no productive capacity, persons with severe disability. LEAP 1000, the focus of the current evaluation, expanded eligibility in 2015 to those households with a pregnant woman or child under the age of 12 months. Over the course of the study households received 13 payments.

Primary and secondary outcome measures: Primary outcomes included current and ever enrolment in NHIS. Secondary outcomes include reasons for not enrolling in NHIS. We conducted a mixed-methods impact evaluation using a quasi-experimental design and estimated intent-to-treat impacts on health insurance enrolment among children and adults. Longitudinal qualitative interviews were conducted with an embedded cohort of 20 women and analyzed using systematic thematic coding.

Results: Current enrolment increased among the treatment group from 37.4% to 46.6% (n=5,523) and decreased among the comparison group from 37.3% to 33.3% (n=4,804), resulting in program impacts of 14 (95% CI: 7.8, 20.5) to 15 (95% CI: 10.6, 18.5) percentage points for current NHIS enrolment. Common reasons for not enrolling were fees and travel.

Conclusion: While impacts on NHIS enrolment were large, gaps remain to maximize the potential of integrated programming. NHIS and LEAP could be better streamlined to ensure poor households fully benefit from both services, in a further step towards integrated social protection.

Trial registration: This study is registered in the International Initiative for Impact Evaluation’s (3ie) Registry for International Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

Funding: Funding for this study was provided to the United Nations Children’s Fund by the United States Agency for International Development (USAID) and the Canadian International Development Agency (CIDA). The funders did not play any role in the data collection, analysis or interpretation of findings.

Data sharing: Data are currently not publicly available but are expected to be released for public use in late 2020 via the Transfer Project (<https://transfer.cpc.unc.edu/tools/data-2/>).

Competing interests: The authors declare no competing interests.

Strengths and limitations of this study

- This is the first study to assess the impact of an integrated government programme providing cash transfers combined with a fee waiver for a national health insurance scheme on health insurance uptake.
- We use a quasi-experimental, longitudinal, mixed-method study design to examine causal impacts of the intervention on health insurance enrolment.
- This study demonstrates that while integration of cash transfers with a fee waiver for health insurance can increase the enrolment, there is a need to improve communication about the integrated programming among all stakeholders.
- A limitation of the study design is that it estimates local average treatment effects, and thus program effects may be larger for individuals in poorer households, further from the proxy means test cut-off used in our sampling criteria, as compared to impacts estimated in this study.

INTRODUCTION

Poverty is a determinant of poor health and reduced access to health care, compounding the former. Increasingly, social protection programs are being implemented globally to reduce poverty and promote increased investment in human capital development, including health.⁽¹⁾ A common social protection program is cash transfers, which entail direct provision to cash to beneficiary households. Robust evidence demonstrates impacts of cash transfer programs on poverty reduction, food security, and increased healthcare expenditure and utilization.⁽²⁻⁵⁾ Existing literature related to health outcomes and health seeking comes largely from Latin America, where cash transfer programs tend to be conditional on health check-ups and other “co-responsibilities.” whereas African programs are largely unconditional, meaning there are no behavioral requirements to maintaining eligibility.

Moreover, impacts of these programmes on health outcomes and behaviors have been less studied in Africa, particularly in the context of unconditional government cash transfer programmes (which make up the majority of government cash transfers in Africa), such as Ghana’s Livelihood Empowerment Against Poverty (LEAP) programme. One notable exception to the regional gap in evidence is a study that examined evidence from a conditional (on school attendance and health clinic visits) cash transfer programme in Tanzania that informally encouraged enrolment in community based health insurance. The study found that the programme increased health insurance take-up and likelihood of seeking care when ill, however increases in health seeking, as measured by clinic visits, took time to materialize (1.5 years) and disappeared after 2.5 years. Impacts of cash transfer programmes on health-related outcomes may vary based on context and program design, including transfer amount and frequency, targeting, and conditions or “co-responsibilities”. Thus, more research is needed on the topic, especially from unconditional programmes.

In Ghana, socioeconomic gaps in health outcomes and access to healthcare persist. For example, populations in the lowest wealth quintiles are more likely than those in the richest quintile to experience

1 teenage pregnancy, under-5 mortality, child mortality, have no vaccinations, and experience stunting, and
2 are less likely to use modern contraceptives or deliver at a health facility.^(6, 7)

3 To mitigate the impact of poverty on health, integrated programming and linkages to services are needed.
4 Linking cash transfers with health insurance is an example of integrated social protection programming
5 (sometimes referred to as “cash plus”).⁽⁸⁾ While enrolment in health insurance does not guarantee access
6 to health or improved health outcomes, it is an important first step to mitigating financial barriers and
7 avoiding catastrophic expenditures. One study from Ghana showed that subsidies effectively promoted
8 enrolment into National Health Insurance Scheme (NHIS),⁽⁹⁾ however, the question of whether a large-
9 scale government-run cash transfer program linked with fee waivers can induce beneficiaries to enroll in
10 health insurance has not been examined.

11 In the past 15 years, the Government of Ghana has implemented two major policy initiatives to address
12 the intersection of poverty and health. In 2003, government passed the National Health Insurance Act
13 (Act 650) and established a National Health Insurance Authority (NHIA). Implementation of the National
14 Health Insurance Scheme (NHIS) began in 2004. The NHIS aims to remove cost barriers to accessing
15 care and covers out-patient and in-patient services, dental services, and maternal health services. The
16 NHIA actively seeks out opportunities to enroll poor and vulnerable persons onto the scheme, as
17 illustrated by their program goals and targeted outreach to enroll members under the ‘indigent’
18 exemption.⁽¹⁰⁾ Act 650 exempted the following groups from paying the NHIS premium: persons classified
19 as poor or indigent, persons over seventy years, children under 18 years, contributors to the Social
20 Security and National Insurance Trust (SSNIT), and pensioners of the SSNIT. Then in 2012, the National
21 Health Insurance Act (Act 852) replaced Act 650 (2003) and expanded these waiver-eligible categories to
22 include persons in need of antenatal, delivery and postnatal healthcare services; persons with mental
23 disorder; and persons categorized as disabled and determined to need social welfare support. It is
24 estimated that over 60 per cent of current NHIS enrollees are exempted from paying premiums,^(10, 11)
25 which make up a small proportion of total funding of the NHIA (estimated at 3 percent of total

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revenue).⁽¹²⁾ The largest sources of revenue for the NHIA are the National Health Insurance Levy (NHIL; a 2.5% levy on goods and services collected under the Value Added Tax) and Social Security and National Insurance Trust (SSNIT) contributions (72 and 20 percent, respectively).⁽¹²⁾ Act 650 originally stipulated that individual premium amounts were set at the district level by district mutual health insurance schemes (DMHIS) and approved by the NHIA, ranging from approximately 7.2 to 48 Ghana Cedis (GHC). However, in 2011 there was a review that adjusted the lower bound to 22 GHC while maintaining the upper bound at 48 GHC. Act 852 (2012) then centralized the management of the scheme including the determination of premiums, and DMHIS no longer have the authority to determine premiums. Enrollees can obtain care from a variety of healthcare providers who are accredited by the NHIA, including public, faith-based, quasi-governmental, and some private health facilities, pharmacies, and chemist shops.⁽¹³⁾ This approach, whereby a purchasing agency (in Ghana, the NHIA) buys care from both public and private facilities, but maintains a parallel supply-side budget allocations from the government to public providers can also be seen in other middle income countries implementing health insurance reforms with the aim of reaching universal health coverage.⁽¹⁴⁾

Annual renewal is required, given that individuals' circumstances (e.g., pregnancy, disability) may change, necessitating that they be placed into a different category, including those covered under premium exemptions. Annual renewal can be a barrier to maintaining enrolment, as a recent cross-sectional study of NHIS enrollees in one district in Ghana showed that drop-out among enrollees is prevalent. It was estimated that 41 percent and 53 percent of enrollees in 2014 and 2015, respectively, dropped out the following year, and that those in the "indigent" premium exemption category were significantly more likely to drop out.⁽¹⁵⁾

By 2014, NHIS coverage was estimated at approximately 40 percent of the population.⁽¹⁶⁾ Despite considerable progress in uptake, significant gaps remain, including limited knowledge of the scheme's services and conditions, long waiting times, drug shortages, and inadequate staffing of health workers, limiting access among the poorest and most marginalized populations.^(13, 16) Among non-members of the

NHIS, affordability of the premium and registration fees is commonly reported as a major barrier to enrolment.^(13, 17, 18) Indeed, a recent study examining ability to pay among household which opted not take up NHIS found that, while 66 percent of uninsured households were estimated to have the ability to afford the premiums, one third were deemed unable to afford the premium.⁽¹⁷⁾

In a second major initiative to address extreme poverty, the Ministry of Gender, Children and Social Protection (MoGCSP) launched a large-scale social protection program, the Livelihoods Empowerment Against Poverty (LEAP) in 2008. LEAP provides bimonthly cash payments ranging from 64-106 GHC to extremely poor households with orphans and vulnerable children, elderly with no productive capacity, persons with severe disability, and, starting in 2015, those with a pregnant woman or child under the age of 12 months. As of December 2017, LEAP reached more than 213,000 extremely poor families in all 216 districts of Ghana. In a step towards better integration of social protection programming, the NHIA and the MoGCSP collaborated in 2011 to enroll LEAP beneficiaries into NHIS, qualifying under the NHIA “indigent” exemption which waives all NHIS fees, including those for card processing, premiums and renewals.

In the current paper, we assessed the impact of the integration of cash and fee waivers in LEAP 1000 on enrolment in the NHIS, hypothesizing that the income effect of the cash transfers paired with the fee waiver would increase take-up.

METHODS

Study setting and design

Data come from the impact evaluation of the Ghana LEAP 1000 pilot program.⁽¹⁹⁾ This pilot added a fourth eligibility category to Ghana’s LEAP program, namely that of poor families with pregnant women (one eligible woman per household) or infants under one year old, aiming to reach poor children in the first 1000 days of their lives to improve nutrition and development[†]. Now integrated into the LEAP program nationally, LEAP 1000 was first piloted in ten districts in northern Ghana. Program participants

1 are informed about the NHIS fee waiver eligibility at the time of enrolment, and awareness campaigns are
2 periodically rolled out (including one during the study period). The longitudinal, mixed-methods
3 evaluation was carried out by UNICEF Office of Research – Innocenti, the University of North Carolina
4 at Chapel Hill (UNC-CH), the Institute of Statistical, Social and Economic Research (ISSER) of the
5 University of Ghana, and Navrongo Health Research Center (NHRC) and covered five of the original ten
6 LEAP 1000 pilot districts (Yendi, Karaga, East Mamprusi in the Northern Region and Bongo and Garu
7 Tempane in the Upper East Region). These districts were purposively selected to reflect demographic
8 diversity in the pilot. To identify a comparison group, the evaluation exploited the program eligibility
9 score (proxy means test, PMT) used in the targeting phase (March to July 2015) to identify eligible
10 participants and collected data only on those households close to the cut-off for maximum comparability.
11 This allowed for a regression discontinuity design which focuses on observations near the cut-off, also
12 referred to as local randomization.⁽²⁰⁾ We examined the satisfaction of RDD-related assumptions: first,
13 the threshold for program eligibility was determined by the government after PMT data was collected and
14 based on the budget available, ensuring exogeneity of the cut-off point. Second, the distribution of the
15 score around the cut-off did not show any discontinuity, indicating lack of manipulation of scores by
16 participants to qualify for the programme. Third, the distribution of household characteristics and
17 outcomes relative to the score at baseline had no discontinuity at the cut-off point and were statistically
18 balanced. More details on the study design and baseline balance of household characteristics between
19 study arms can be found in the baseline evaluation reportⁱⁱ.⁽²¹⁾
20 The PMT includes assets, dwelling characteristics, household size, etc. Households falling below the cut-
21 off, those classified as extremely poor by the PMT, were enrolled in the program. The study was powered
22 to detect program impacts on child health and nutrition outcomes, with an estimated required sample size
23 of 2,500 households, half from the comparison group (above the PMT cut-off) and half from the treatment
24 group (below the PMT cut-off). The baseline survey was conducted in July-September 2015 with 2,497
25 women that were pregnant at the time of the targeting exercise or had a child under 15 months of age. Of

these households, 2,331 were re-interviewed at endline (implemented between June and August 2017).

LEAP 1000 payments commenced in September 2015. At endline we found high level of compliance in the treatment group (88.3%). Thus, we focus on Intention-to-Treat (ITT) estimates. For robustness, we also examine ATT, and results were very similar.

The qualitative component of the evaluation included in-depth interviews a cohort of 20 beneficiary women from the treatment arm at baseline, 12 and 24-months' follow-up. Male partners of beneficiaries were interviewed during the 12 and 24-month follow-up visits. The purposive sample of the embedded cohort focused on geographic location (remote v. closer to markets) and parity (first time mother vs women with 3+ children) to facilitate comparative analysis.

Ethics review and study registration

The quantitative component was reviewed by the Ethics Committee for the Humanities of the University of Ghana and the qualitative component by the Institutional Review Boards at UNC-CH and NHRC. The trial is registered in the International Initiative for Impact Evaluation's (3ie) Registry for International Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

Patient and Public Involvement statement

Patients were not involved in this study. The development of the initiative being evaluated, research questions and outcome measures were informed by a vulnerability analysis which indicated that marginalized populations eligible for premium fee waivers under the NHIS were often not enrolling in the scheme. Research findings from the larger impact evaluation were disseminated in March 2019 to national policymakers and stakeholders, including district welfare officers, who liaise directly with program participants.

Measures

Primary outcomes included current and ever enrolment in NHIS. For household member aged five years and above, a series of questions were asked to the main survey respondent, including whether the

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individual was covered under any health insurance scheme (NHIS was a response option). Then respondents were asked if the individual had ever been enrolled in NHIS (endline only) and whether the individual currently had a valid NHIS card. Analyzing ever enrolment allowed us to further disaggregate those that were not enrolled at endline into those never enrolled and those previously enrolled but not currently holding a valid NHIS card at endline.

For those not enrolled, we examined reasons why, including premium was too expensive, respondent did not realize the card expired, travel time or related cost was too high, lack of awareness that card must be renewed annually, respondent had not been sick, waiting times at renewal location are too long, perceived poor quality of NHIS/preferred services not covered, NHIS office was closed, and other reasons.

Qualitative interviews elicited narratives of program impact within each household and context to facilitate interpretation, probing specifically on enrollment and renewal in NHIS. We used a semi-structured guide, audio-recorded and transcribed verbatim and translated all interviews. All interviewers and participants were matched on gender and local language preference.

Statistical analyses

Our analytic sample included individuals who were interviewed both at baseline and endline, and we stratified analyses by age: children aged 5 to15 years at baseline and older children and adults aged 16 years and above at baseline and thus aged 18 years and above by endline.

We examined balance among background characteristics and outcomes at baseline between treatment and comparison individuals. Then we investigated if attritors differed in background characteristics by treatment status (differential attrition), which could threaten internal validity and unbiasedness of our estimates.

Next, we conducted bivariate analyses to examine background characteristics associated with enrolment status, controlling for PMT score. Categories of enrolment in NHIS included: 1) currently enrolled, 2) currently not enrolled but previously enrolled (ever) and 3) never enrolled.

To estimate treatment impacts of LEAP 1000 on NHIS enrolment, we utilized a difference-in-differences (DID) approach as specified in equation 1.

$$Y_{ijt} = \beta_0 + \beta_1 P_{ij} + \beta_2 T_t + \beta_3 P_{ij} * T_t + \beta_4 X_{ijt} + \lambda_j + \varepsilon_{ijt} \quad (1)$$

Where Y_{ijt} is a binary variable indicating whether individual i residing in community j is enrolled in NHIS in year t . P_{ij} is a dummy indicator for individual's i participation into LEAP 1000, equal to 1 if his or her household is assigned to treatment and 0 otherwise. T_t is a time binary variable, set to 1 if the observation is from the endline survey, and to 0 if it is from the baseline. $P_{ij} * T_t$ is the interaction term between the program and time dummies. X_{ijt} includes a set of observed individual (gender, age and age squared in years) and household characteristics [age, gender and education (no formal education versus some education) of the household head; household size and PMT score]. The model also controls for community fixed effects, λ_j , to absorb unobserved-time invariant characteristics of communities. β_3 is the intent-to-treat (ITT) impact estimate. Standard errors were clustered at the community level. A key assumption in the DID estimation model is that treatment and comparison groups experience parallel trends over time. However, while this assumption cannot be tested in the current study due to a lack of availability of pre-baseline data) we expect the assumption to hold given the high level of similarity between treatment and comparison households (sampled from the same communities) at baseline. .

For the qualitative analysis, we first developed a longitudinal summary for each household, integrating women's and men's interviews when both were available, to capture the story of impact over time. We summarized patterns in enrollment and renewals across household members and coded for topics related to NHIS using Atlas.ti software.

RESULTS

At baseline, data for 4,736 children and 6,865 adults were reported, while at endline 4,197 and 6,130 of these children and adults, respectively, remained part of the sample households (11% overall attrition for

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both age groups; Figure A1 and Table A1 in Appendix). Attrition rates were similar between study arms, and attrition by background characteristics and outcomes did not vary between groups (Table A2 in Appendix).

[Table 1 approximately here]

The child sample was 46.6 percent female, and average age was 8.9 years (SD=2.9), while the adult sample was 56.3 percent female, and average age was 36.7 years (SD=15.2). Average household size was 7.6 members (SD=3.0), and 6 percent of households had female heads. Further, 81.9 percent of heads had no formal education (figures comprise averages calculated from values in Columns 2 and 5, Appendix Table A2). Over the study period, NHIS enrolment increased among the treatment group from 37.4 percent to 46.6 percent and decreased among the comparison group from 37.3 percent to 33.3 percent (Figures 1 and 2).

[Figures 1 and 2 approximately here]

In bivariate analyses (Table 1), characteristics positively associated with enrolment included younger age (current and ever), female (current and ever), higher head education levels (current and ever), female headship (current and ever), smaller households (current and ever), and Karaga district (ever). There were no differences in enrolment by extreme poverty status.

[Table 2 approximately here]

Among those previously enrolled but not currently enrolled at endline, the most commonly reported reasons were enrolment fee/premium was too expensive (75.32 percent; Table 2), not realizing card expired (11.36 percent), and travel time/travel cost was too high (9.28 percent). Qualitative interviews identified barriers to renewal including long wait times, competing demands with work, cost of transport, and poor road conditions. Cost was also a salient barrier, reflecting both extreme poverty as well as

1 confusion about their NHIS fee exemption status. As a male participant in Bongo stated simply, “*That*
2 *money (the transfer) is not even enough to register for the children and the woman.*”

3 Reasons for never enrolment were similar: 65.44 percent reported enrolment fee/premium too expensive,
4 14.94 percent report travel time/travel cost too high, and another commonly reported reason was waiting
5 times (Table 2). Some participants described that the LEAP program had come to their house to take their
6 cards for renewal, eliminating some of the aforementioned barriers. Others described using their LEAP
7 cash transfer to pay for renewal and viewed LEAP as facilitating their enrolment or renewal due to the
8 cash provided by the program.

9 [Table 3 approximately here]

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11 Qualitative findings echoed the patterns from the quantitative analyses, with both women and men
12 indicating that women and children were the priority for enrolment. While perceptions of NHIS benefits
13 were generally positive, at baseline several discussed never having enrolled because they questioned the
14 quality of the coverage in terms of types of services included and a perception that medication was not
15 covered (despite the fact that NHIS does cover medications, in and outside of facilities at accredited
16 chemists/pharmacies). There were additional concerns about the quality of care for people using NHIS
17 versus those paying for services, as reflected by a mother in Karaga at baseline,

18 “*Some people say when you visit the hospital with it the doctors don’t want to attend to you but if*
19 *you do not have one, that one they will attend to you. This is the reason why we aren’t interested*
20 *in it.*”

21 Notably, she was enrolled by the endline interview, reflecting the potential impact of the integrated
22 programming on improving acceptance and reducing enrolment barriers.

23 Impact estimates indicate that LEAP 1000 increased current NHIS enrolment by 14 (95% CI 7.83 –20.52)
24 and 15 (95% CI 10.63–18.46) percentage points for children and adults, respectively (Table 3, first two
25 columns). Further, LEAP 1000 increased the proportion of adults reporting having ever been enrolled by

7 (95% CI 0.97–12.80) percentage points (Table 3, last two columns). The impact on ever enrolment was not significant for children.

Most participants reflected a positive experience or perceptions of NHIS as a way to save costs on health care. Among those who had used NHIS, nearly all were satisfied and felt that having insurance had helped them to save money when seeking healthcare. A mother in Karaga identified NHIS enrolment as a major component of LEAP impact, which she further linked to overall poverty reduction,

Now the LEAP 1000 has given us the chance to register for the NHIS and reduced the poverty levels of mothers. It was a big problem for most mothers to get money and register for the NHIS but now it is easy for all beneficiaries of the LEAP programme.

This sentiment was echoed by other mothers who appreciated that being in LEAP had allowed them to enroll and/or renew their families in NHIS and take better care of their family’s health. Some participants discussed lack of medication and other supplies as a barrier to getting care even when you have insurance, as reflected by a father in Bongo, “*You know the insurance, when we sent the child, they gave us a prescription to buy medicine because there was no medicine in the hospital.*”

Some participants mentioned that in cases like this, they could use their LEAP money to purchase medication, which helped to protect their children’s health.

DISCUSSION

This study demonstrated that an integrated government social protection program pairing cash transfers with fee waivers for national health insurance enrolment increased enrolment into NHIS among both children and adults. Our findings contribute to the literature on “cash plus” programs by providing evidence of the impact of integrating cash with a health insurance fee waiver to increase enrolment. Virtually all studies to date on this topic have looked at impacts of cash only or conditional cash transfers on morbidity and use of health facilities and have found limited impact, particularly on adult morbidity.⁽²⁾

1 Our findings highlight a potential pathway to increase the health impacts of unconditional cash transfer
2 programs by increasing access to preventive and curative healthcare services through insurance coverage.
3 While impacts on enrolment were considerably large, enrolment gaps remain, particularly for adults. The
4 salience of cost as a perceived barrier to enrolment both confirms existing research on the topic,^(13, 17) and
5 reflects insufficient communication or misunderstanding of the integration of the fee waiver with LEAP.
6 This highlights the need to improve communication with both program participants and implementers to
7 maximize the potential impact of this integration and protect against beneficiaries using their transfer to
8 purchase insurance. Additionally, even with the fee waiver, the annual renewal requirement for NHIS can
9 be difficult for poor families to comply with, often leading to expiration of benefits, as highlighted in
10 previous research.⁽¹⁵⁾ Such gaps demonstrate operational issues within both programs that could be better
11 streamlined to ensure that eligible households fully benefit from both services. Extending the validity
12 period for NHIS beyond one year for LEAP households, thereby reducing the financial and time burden
13 for annual renewal, is one recommendation. Also, data systems could be linked, allowing field officers to
14 track enrolment and validity along with their routine monitoring. Finally, better orientation could be
15 provided to the NHIA workers, ensuring that they do not mistakenly charge fees to exempt LEAP
16 households.

17 One limitation of this study is that impact estimates are likely lower bounds of program impacts, given
18 the local average treatment impacts estimated among a sampled treatment group, which is relatively
19 “better off” than other LEAP households further from the eligibility cut-off.

20 Findings underscore the need to improve education among beneficiaries around the annual renewal
21 requirement and exemption from paying premiums. Such findings have implications for Ghana and other
22 countries looking to integrate their cash transfer programs with access to health services, which must be
23 done not only at policy level but also with practical implementation modalities for the end user.

24 Moreover, access to health insurance is a necessary but not sufficient condition for ensuring access to
25 healthcare. Individuals can enroll but still face barriers to access related to distances to facilities, quality

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1 of services offered, and attitudes of staff, among others. This study has demonstrated how integrated
2 programming can improve enrolment rates, but large gaps remain. Future research should investigate how
3 to promote continued enrolment, as well as how integrated cash plus programs can achieve impact on
4 health outcomes beyond access to care, including morbidity, mortality and mental health.

5

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ⁱ Infants under 15 months were accepted as eligible to avoid excluding children due to variations in quality of birth date data and/or the extended duration of the targeting process.

ⁱⁱ The success in the implementation of an RDD necessitates that 1) participants were not able to manipulate their PMT score, 2) the threshold is determined independently of the rating variable, and 3) no discontinuities are present other than the treatment status in baseline characteristics and outcomes.

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List of Figures

- Figure 1. Proportion of children (5-17 years old) with valid NHIS card for the current year
- Figure 2. Proportion of adults (18+ years old) with valid NHIS card for the current year
- Figure A1. Flowchart of study sample

Table

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1: Bivariate analyses of background characteristics by enrolment status, Ages 7-103 at endline

	Means of characteristics			P-value of difference		
	Never enrolled with NHIS	Ever enrolled but currently no valid NHIS	Currently valid NHIS	Col(1)-Col(2)	Col(1)-Col(3)	Col(2)-Col(3)
	(1)	(2)	(3)	(4)	(5)	(6)
Age	24.92	19.26	16.45	0.00	0.00	0.00
Female	0.40	0.53	0.56	0.00	0.00	0.00
Elder (Age>=70 years)	0.03	0.02	0.02	0.01	0.21	0.04
Female elder	0.02	0.01	0.01	0.15	0.74	0.19
Male elder	0.02	0.01	0.01	0.01	0.17	0.05
Household size	7.62	7.73	7.29	0.68	0.00	0.03
Educational level of head	2.40	3.81	4.31	0.00	0.14	0.00
Head no formal schooling	0.88	0.82	0.79	0.00	0.03	0.00
Head is female	0.04	0.06	0.08	0.03	0.01	0.00
Age of head	40.09	40.71	40.17	0.30	0.05	0.53
Poor	0.99	0.98	0.98	0.72	0.45	0.35
Extremely poor	0.91	0.89	0.89	0.20	0.84	0.16
Karaga district	0.40	0.21	0.12	0.00	0.01	0.00
Yendi district	0.10	0.19	0.16	0.00	0.21	0.06
Bongo district	0.07	0.12	0.19	0.00	0.00	0.00
Garu-Tempane district	0.09	0.18	0.13	0.00	0.01	0.06
N	8,378	8,035	11,695			

Source: Authors' analysis. Notes: Mean values represent unadjusted statistics. P-values in Columns 4,5,6 correspond to the coefficient on each enrolment group from a regression predicting each characteristic listed in the table controlling for PMT score. Standard errors clustered at the community level.

**Table 2: Reasons for not renewing/never having NHIS by treatment status, Ages 7-103 at
endline**

	All	Comparison	Treatment	P-value of diff.
Ever enrolled but no valid NHIS	41.54	44.65	38.77	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	75.32	80.34	70.14	0.00
Did not realized card expired	11.36	10.61	12.14	0.54
Travel time/cost too high	9.28	8.40	10.19	0.37
Not aware had to be renewed annually	6.77	6.22	7.34	0.31
Has not been sick	1.59	1.49	1.70	0.68
Waiting time at renewal too long	3.05	1.15	5.00	0.00
Poor quality care with NHIS - preferred services not covered	0.32	0.19	0.45	0.18
NHIS office closed	0.44	0.19	0.70	0.19
Other (card lost, no time, etc.)	0.25	0.19	0.32	0.22
<i>N</i>	6,336	3,215	3,121	
Never enrolled with NHIS	18.98	22.29	16.02	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	65.44	65.28	65.64	0.92
Travel time/cost too high	14.94	17.67	11.56	0.02
Waiting time at renewal too long	4.85	4.23	5.62	0.24
Poor quality care with NHIS - preferred services not covered	3.30	2.36	4.47	0.01
Don't understand NHIS	0.28	0.19	0.39	0.39
Other	10.84	10.14	11.71	0.41
<i>N</i>	2,905	1,607	1,298	

Source: Authors' analysis. Notes: P-values are reported from Wald tests on the equality of means of Treatment and Comparison for each variable. Standard errors are clustered at the community level.

Table 3: Impact estimates of Ghana LEAP 1000 on current NHIS enrolment and ever enrolment, by age groups

	DID impact on current NHIS enrolment		OLS impact on ever NHIS enrolment	
	Ages 7-17 years at baseline	Ages 18+ years at baseline	Ages 7-17 years at baseline	Ages 18+ years at baseline
DID (Treatment X Time)	0.14 (0.03)***	0.15 (0.02)***		
Treatment	-0.01 (0.03)	0.01 (0.03)	0.05 (0.03)	0.07 (0.03)**
Time	-0.14 (0.03)***	-0.05 (0.02)**		
Age	-0.01 (0.00)***	-0.00 (0.00)***	-0.01 (0.01)	-0.00 (0.00)***
Age squared	-0.00 (0.00)**	0.00 (0.00)***	0.00 (0.00)	0.00 (0.00)**
Female	0.00 (0.01)	0.20 (0.01)***	-0.00 (0.01)	0.20 (0.01)***
PMT score	-0.02 (0.18)	0.21 (0.15)	-0.01 (0.16)	0.22 (0.18)
Household size	-0.00 (0.00)	-0.00 (0.00)*	-0.00 (0.00)	0.00 (0.00)
Head is female	-0.08 (0.03)***	-0.03 (0.02)	-0.01 (0.02)	-0.06 (0.02)**
Age of head	-0.00 (0.00)	0.00 (0.00)***	-0.00 (0.00)	0.00 (0.00)*
Head no formal schooling	-0.05 (0.03)*	-0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)
R^2	0.14	0.13	0.25	0.23
N	8,394	12,260	4,192	6,130
Baseline means	0.449	0.323		
Endline comparison means	0.311	0.276	0.832	0.746

Source: Authors' analysis. Notes: All regressions include the following covariates at baseline: Age, dummy for female (0,1), household head's age, dummy for having no formal education (0,1), dummy for women household head (0,1), PMT score, household size; community fixed effects. Impact from difference-in-difference estimates; impact on ever NHIS enrolment from single difference estimates. Analysis restricted to a panel sample. Standard errors in parenthesis clustered at the community level. * $p < 0.1$ ** $p < 0.05$; *** $p < 0.01$.

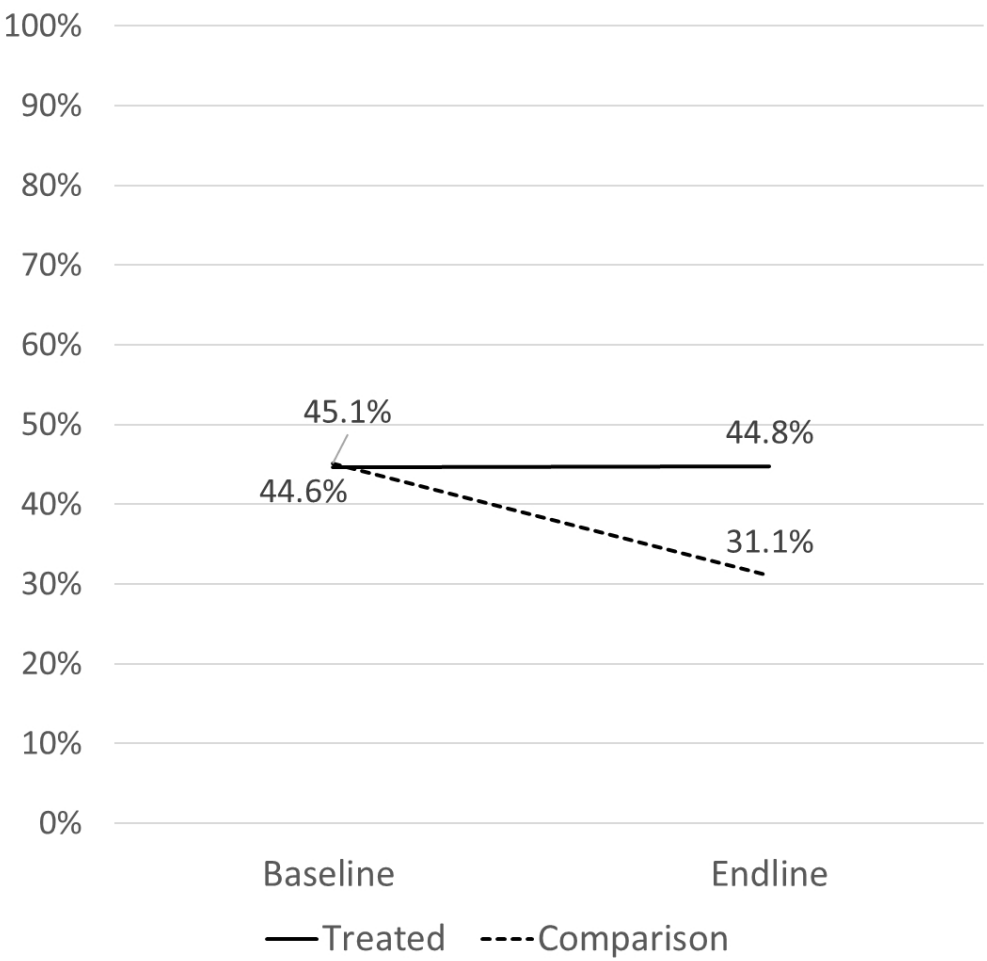


Figure 1. Proportion of children (5-17 years old) with valid NHIS card for the current year
90x90mm (300 x 300 DPI)

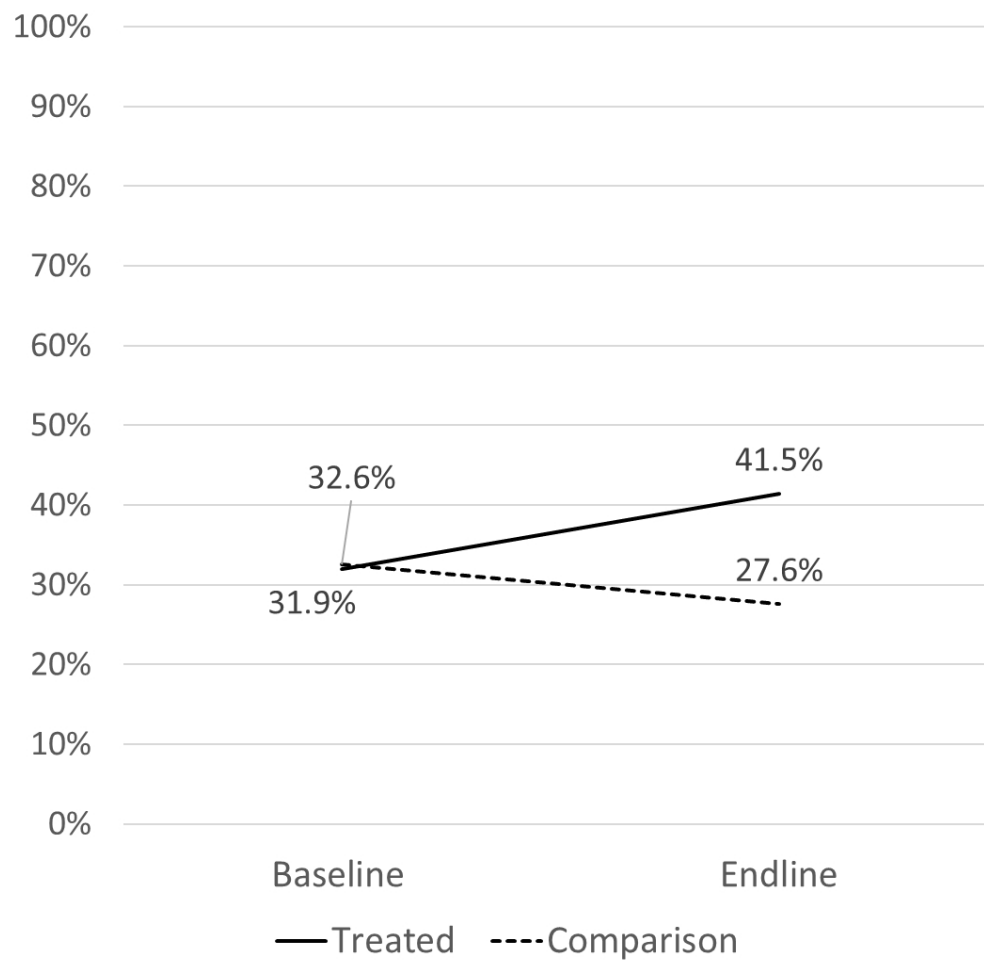


Figure 2. Proportion of adults (18+ years old) with valid NHIS card for the current year

90x90mm (300 x 300 DPI)

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Appendices

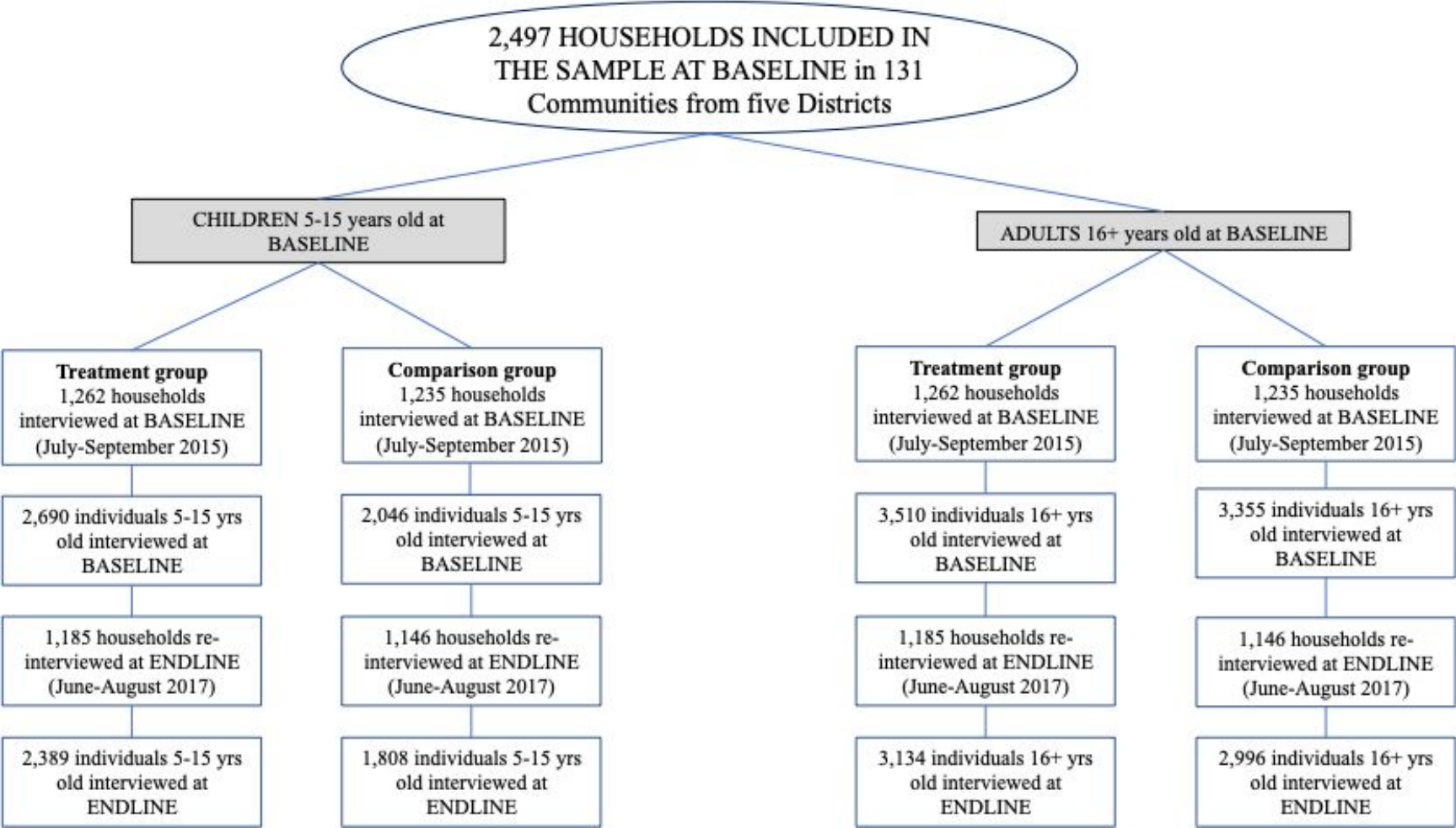


Figure A1. Flowchart of Study Sample

Table A1: Attrition by treatment status and age group

	N	All	Comparison	Treatment	P-value of diff.
<i>Individuals aged 5-15 years at baseline</i>					
Attrition rate	4,736	0.11	0.12	0.11	0.755
<i>Individuals aged 16+ at baseline</i>					
Attrition rate	6,865	0.11	0.11	0.11	0.989

T-test based on standard errors clustered at the community level.

Table A2: Individual differential attrition (from baseline to endline) by baseline characteristics

	Control			Treatment			Difference		Balance	
	Attritors	Panel	P-value	Attritors	Panel	P-value	Col(1)-Col(4)	P-value	Col(2)-Col(5)	P-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Individuals aged 5-15 years at baseline										
<i>Background characteristics</i>										
Age (years)	9.90	8.83	0.000	10.00	8.93	0.000	-0.52	0.428	0.01	0.966
Age squared	108.46	87.04	0.000	110.51	88.51	0.000	-10.83	0.424	-0.32	0.925
Female (0,1)	0.62	0.46	0.000	0.56	0.47	0.003	-0.03	0.730	-0.01	0.828
Household size	9.42	8.01	0.000	10.13	8.44	0.000	-0.14	0.881	0.29	0.461
Head is female (0,1)	0.07	0.06	0.583	0.04	0.07	0.009	0.00	0.987	0.05	0.039
Age of head (years)	43.66	41.76	0.077	45.47	42.69	0.021	2.10	0.435	-0.79	0.448
Head no formal schooling (0,1)	0.85	0.84	0.818	0.90	0.85	0.035	-0.07	0.257	0.03	0.486
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.37	0.45	0.014	0.30	0.45	0.001	0.10	0.186	0.01	0.836
N	238	1,808		301	2,389					
Individuals aged 16+ at baseline										
<i>Background characteristics</i>										
Age (years)	36.31	36.06	0.834	35.67	37.30	0.247	1.49	0.632	-0.11	0.871
Age squared	1,713.16	1,528.12	0.107	1,676.83	1,626.01	0.716	147.23	0.621	-11.17	0.863
Female (0,1)	0.54	0.56	0.454	0.56	0.56	0.957	0.05	0.375	0.01	0.311
Household size	8.43	6.88	0.000	9.31	7.57	0.000	0.11	0.887	0.32	0.184
Head is female (0,1)	0.08	0.05	0.135	0.07	0.07	0.740	-0.01	0.771	0.04	0.037
Age of head (years)	42.77	38.50	0.001	44.95	41.12	0.001	-3.71	0.163	0.32	0.754
Head no formal schooling (0,1)	0.75	0.78	0.379	0.81	0.82	0.776	-0.13	0.109	0.05	0.189
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.26	0.33	0.016	0.21	0.32	0.000	0.05	0.459	0.03	0.259
N	359	2,996		376	3,134					

Mean values represent unadjusted statistics. P-values in Column 8 are from the coefficient on treatment from a regression predicting each characteristic listed in the table controlling for PMT score, among the group of attritors, while Column 10 is the same among the panel sample. Standard errors clustered at the community level.

CHEERS checklist—Items to include when reporting economic evaluations of health interventions

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as “cost-effectiveness analysis”, and describe the interventions compared.	page 1, line 1 to 2
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	page 3, line 1 to 24
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study.	page 5, line 12 to 14
		Present the study question and its relevance for health policy or practice decisions.	page 8, line 15 to 17
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	page 8, line 21 to page 9, line 12; Table 1
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	page 9, lines 5 to 10
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	P8, line 7; P7, lines 5-7
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	Page 8, line 5 to 14
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	Page 9, lines 24 to P10, line 2
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	N/a
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	Page 10, lines 23 to P11, line 13
Measurement of effectiveness	11a	<i>Single study-based estimates:</i> Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	Page 12, line 1 to 15; P9, lines 8-19
	11b	<i>Synthesis-based estimates:</i> Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	N/a
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	N/a
Estimating resources and costs	13a	<i>Single study-based economic evaluation:</i> Describe approaches used to estimate resource use associated with the alternative interventions. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	N/a
	13b	<i>Model-based economic evaluation:</i> Describe approaches and data sources used to estimate	Page 12, line 1 to 15; P9, lines 8-19

Section/item	Item No	Recommendation	Reported on page No/ line No
		resource use associated with model health states. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	
Currency, price date, and conversion	14	Report the dates of the estimated resource quantities and unit costs. Describe methods for adjusting estimated unit costs to the year of reported costs if necessary. Describe methods for converting costs into a common currency base and the exchange rate.	N/a
Choice of model	15	Describe and give reasons for the specific type of decision-analytical model used. Providing a figure to show model structure is strongly recommended.	Page 11, lines 18-21; P12, lines 1 to 13
Assumptions	16	Describe all structural or other assumptions underpinning the decision-analytical model.	Page 9, lines 12 to 19; Page 12, lines 11 to 15;
Analytical methods	17	Describe all analytical methods supporting the evaluation. This could include methods for dealing with skewed, missing, or censored data; extrapolation methods; methods for pooling data; approaches to validate or make adjustments (such as half cycle corrections) to a model; and methods for handling population heterogeneity and uncertainty.	Page 11, line 18 to 24; to Page 12, lines 1 to 11
Study parameters	18	Report the values, ranges, references, and, if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	Tables 1-3
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	N/a
Characterising uncertainty	20a	<i>Single study-based economic evaluation:</i> Describe the effects of sampling uncertainty for the estimated incremental cost and incremental effectiveness parameters, together with the impact of methodological assumptions (such as discount rate, study perspective).	N/a
	20b	<i>Model-based economic evaluation:</i> Describe the effects on the results of uncertainty for all input parameters, and uncertainty related to the structure of the model and assumptions.	Standard errors of point estimates reported in Table 3
Characterising heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	N/a
Discussion			
Study findings, limitations, generalisability, and current knowledge	22	Summarise key study findings and describe how they support the conclusions reached. Discuss limitations and the generalisability of the findings and how the findings fit with current knowledge.	Page 15, lines 19 to 21; Page 16, lines 17 to 19
Other			
Source of funding	23	Describe how the study was funded and the role of	Page 3, lines 27 to 30

Section/item	Item No	Recommendation	Reported on page No/ line No
		the funder in the identification, design, conduct, and reporting of the analysis. Describe other non-monetary sources of support.	
Conflicts of interest	24	Describe any potential for conflict of interest of study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors recommendations.	No conflicts of interest reported
For consistency, the CHEERS statement checklist format is based on the format of the CONSORT statement checklist			

BMJ Open

Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana's National Health Insurance Scheme

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Secondary Subject Heading:	Global health
Keywords:	Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Public health < INFECTIOUS DISEASES, Economics < TROPICAL MEDICINE, cash transfers, health insurance waivers, Ghana

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Manuscripts

Impact evaluation of a social protection program paired with fee waivers on enrolment in Ghana’s National Health Insurance Scheme

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Author contributions: TP, EV, GA, MdM, CA, TS and CB were involved in study design, interpretation of data and contributed to drafting of article. TP, EV, GA, MdM, CA, TS and CB had access to the data. TP and EV wrote the first draft of the manuscript and all authors critically reviewed the manuscript and contributed to writing the final draft. EV carried out statistical analysis, and EV, GA, CA, and TP contributed to modelling and interpretation of statistical analyses. MdM and CB conducted qualitative analysis. TP, EV, GA, MdM, CA, TS and CB approved the final version. A majority of the work for this paper was completed while the corresponding author (TP) was affiliated with UNICEF Office of Research – Innocenti and she has since moved to the University at Buffalo (SUNY).

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Abstract

Objectives: To understand the impact of integrating a fee waiver for the National Health Insurance Scheme (NHIS) with Ghana’s Livelihood Empowerment Against Poverty (LEAP) 1000 cash transfer program on health insurance enrolment.

Setting: Five districts implementing Ghana’s LEAP 1000 program in Northern and Upper East Regions.

Participants: Women, from LEAP households, who were pregnant or had a child under one year and who participated in baseline and 24-month surveys (2,497).

Intervention: LEAP provides bimonthly cash payments combined with a premium waiver for enrolment in NHIS to extremely poor households with orphans and vulnerable children, elderly with no productive capacity, persons with severe disability. LEAP 1000, the focus of the current evaluation, expanded eligibility in 2015 to those households with a pregnant woman or child under the age of 12 months. Over the course of the study households received 13 payments.

Primary and secondary outcome measures: Primary outcomes included current and ever enrolment in NHIS. Secondary outcomes include reasons for not enrolling in NHIS. We conducted a mixed-methods impact evaluation using a quasi-experimental design and estimated intent-to-treat impacts on health insurance enrolment among children and adults. Longitudinal qualitative interviews were conducted with an embedded cohort of 20 women and analyzed using systematic thematic coding.

Results: Current enrolment increased among the treatment group from 37.4% to 46.6% (n=5,523) and decreased among the comparison group from 37.3% to 33.3% (n=4,804), resulting in program impacts of 14 (95% CI: 7.8, 20.5) to 15 (95% CI: 10.6, 18.5) percentage points for current NHIS enrolment. Common reasons for not enrolling were fees and travel.

Conclusion: While impacts on NHIS enrolment were significant, gaps remain to maximize the potential of integrated programming. NHIS and LEAP could be better streamlined to ensure poor households fully benefit from both services, in a further step towards integrated social protection.

Trial registration: This study is registered in the International Initiative for Impact Evaluation’s (3ie) Registry for International Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

Funding: Funding for this study was provided to the United Nations Children’s Fund by the United States Agency for International Development (USAID) and the Canadian International Development Agency (CIDA). The funders did not play any role in the data collection, analysis or interpretation of findings.

Data sharing: Data are currently not publicly available but are expected to be released for public use in late 2020 via the Transfer Project (<https://transfer.cpc.unc.edu/tools/data-2/>).

Competing interests: The authors declare no competing interests.

Strengths and limitations of this study

- This is the first study to assess the impact of an integrated government programme providing cash transfers combined with a fee waiver for a national health insurance scheme on health insurance uptake.
- We use a quasi-experimental, longitudinal, mixed-method study design to examine causal impacts of the intervention on health insurance enrolment.
- This study demonstrates that while integration of cash transfers with a fee waiver for health insurance can increase the enrolment, large gaps remain.
- A limitation of the study design is that it estimates local average treatment effects, and thus program effects may be larger for individuals in poorer households, further from the proxy means test cut-off used in our sampling criteria, as compared to impacts estimated in this study.

INTRODUCTION

Poverty is a determinant of poor health and reduced access to health care, compounding the former. Increasingly, social protection programs are being implemented globally to reduce poverty and promote increased investment in human capital development, including health.⁽¹⁾ A common social protection program is cash transfers, which entail direct provision to cash to beneficiary households. Robust evidence demonstrates impacts of cash transfer programs on poverty reduction, food security, and increased healthcare expenditure and utilization.⁽²⁻⁵⁾ Existing literature related to health outcomes and health seeking comes largely from Latin America, where cash transfer programs tend to be conditional on health check-ups and other “co-responsibilities.” whereas African programs are largely unconditional, meaning there are no behavioral requirements to maintaining eligibility.

Moreover, impacts of these programmes on health outcomes and behaviors have been less studied in Africa, particularly in the context of unconditional government cash transfer programmes (which make up the majority of government cash transfers in Africa), such as Ghana’s Livelihood Empowerment Against Poverty (LEAP) programme. One notable exception to the regional gap in evidence is a study that examined evidence from a conditional (on school attendance and health clinic visits) cash transfer programme in Tanzania that informally encouraged enrolment in community based health insurance. The study found that the programme increased health insurance take-up and likelihood of seeking care when ill, however increases in health seeking, as measured by clinic visits, took time to materialize (1.5 years) and disappeared after 2.5 years. Impacts of cash transfer programmes on health-related outcomes may vary based on context and program design, including transfer amount and frequency, targeting, and conditions or “co-responsibilities”. Thus, more research is needed on the topic, especially from unconditional programmes.

In Ghana, socioeconomic gaps in health outcomes and access to healthcare persist. For example, populations in the lowest wealth quintiles are more likely than those in the richest quintile to experience

1 teenage pregnancy, under-5 mortality, child mortality, have no vaccinations, and experience stunting, and
2 are less likely to use modern contraceptives or deliver at a health facility.^(6, 7)

3 To mitigate the impact of poverty on health, integrated programming and linkages to services are needed.
4 Linking cash transfers with health insurance is an example of integrated social protection programming
5 (sometimes referred to as “cash plus”).⁽⁸⁾ While enrolment in health insurance does not guarantee access
6 to health or improved health outcomes, it is an important first step to mitigating financial barriers and
7 avoiding catastrophic expenditures. One study from Ghana showed that subsidies effectively promoted
8 enrolment into National Health Insurance Scheme (NHIS),⁽⁹⁾ however, the question of whether a large-
9 scale government-run cash transfer program linked with fee waivers can induce beneficiaries to enroll in
10 health insurance has not been examined.

11 In the past 15 years, the Government of Ghana has implemented two major policy initiatives to address
12 the intersection of poverty and health. In 2003, government passed the National Health Insurance Act
13 (Act 650) and established a National Health Insurance Authority (NHIA). Implementation of the National
14 Health Insurance Scheme (NHIS) began in 2004. The NHIS aims to remove cost barriers to accessing
15 care and covers out-patient and in-patient services, dental services, and maternal health services. The
16 NHIA actively seeks out opportunities to enroll poor and vulnerable persons onto the scheme, as
17 illustrated by their program goals and targeted outreach to enroll members under the ‘indigent’
18 exemption.⁽¹⁰⁾ Act 650 exempted the following groups from paying the NHIS premium: persons classified
19 as poor or indigent, persons over seventy years, children under 18 years, contributors to the Social
20 Security and National Insurance Trust (SSNIT), and pensioners of the SSNIT. Then in 2012, the National
21 Health Insurance Act (Act 852) replaced Act 650 (2003) and expanded these waiver-eligible categories to
22 include persons in need of antenatal, delivery and postnatal healthcare services; persons with mental
23 disorder; and persons categorized as disabled and determined to need social welfare support. It is
24 estimated that over 60 per cent of current NHIS enrollees are exempted from paying premiums,^(10, 11)
25 which make up a small proportion of total funding of the NHIA (estimated at 3 percent of total

1 revenue).⁽¹²⁾ The largest sources of revenue for the NHIA are the National Health Insurance Levy (NHIL;
2 a 2.5% levy on goods and services collected under the Value Added Tax) and Social Security and
3 National Insurance Trust (SSNIT) contributions (72 and 20 percent, respectively).⁽¹²⁾ Act 650 originally
4 stipulated that individual premium amounts were set at the district level by district mutual health
5 insurance schemes (DMHIS) and approved by the NHIA, ranging from approximately 7.2 to 48 Ghana
6 Cedis (GHC). However, in 2011 there was a review that adjusted the lower bound to 22 GHC while
7 maintaining the upper bound at 48 GHC. Act 852 (2012) then centralized the management of the scheme
8 including the determination of premiums, and DMHIS no longer have the authority to determine
9 premiums. Enrollees can obtain care from a variety of healthcare providers who are accredited by the
10 NHIA, including public, faith-based, quasi-governmental, and some private health facilities, pharmacies,
11 and chemist shops.⁽¹³⁾ This approach, whereby a purchasing agency (in Ghana, the NHIA) buys care from
12 both public and private facilities, but maintains a parallel supply-side budget allocations from the
13 government to public providers can also be seen in other middle income countries implementing health
14 insurance reforms with the aim of reaching universal health coverage.⁽¹⁴⁾
15 Annual renewal is required, given that individuals' circumstances (e.g., pregnancy, disability) may
16 change, necessitating that they be placed into a different category, including those covered under
17 premium exemptions. Annual renewal can be a barrier to maintaining enrolment, as a recent cross-
18 sectional study of NHIS enrollees in one district in Ghana showed that drop-out among enrollees is
19 prevalent. It was estimated that 41 percent and 53 percent of enrollees in 2014 and 2015, respectively,
20 dropped out the following year, and that those in the "indigent" premium exemption category were
21 significantly more likely to drop out.⁽¹⁵⁾
22 By 2014, NHIS coverage was estimated at approximately 40 percent of the population.⁽¹⁶⁾ Despite
23 considerable progress in uptake, significant gaps remain, including limited knowledge of the scheme's
24 services and conditions, long waiting times, drug shortages, and inadequate staffing of health workers,
25 limiting access among the poorest and most marginalized populations.^(13, 16) Among non-members of the

1 NHIS, affordability of the premium and registration fees is commonly reported as a major barrier to
2 enrolment.^(13, 17, 18) Indeed, a recent study examining ability to pay among household which opted not take
3 up NHIS found that, while 66 percent of uninsured households were estimated to have the ability to afford
4 the premiums, one third were deemed unable to afford the premium.⁽¹⁷⁾

5 In a second major initiative to address extreme poverty, the Ministry of Gender, Children and Social
6 Protection (MoGCSP) launched a large-scale social protection program, the Livelihoods Empowerment
7 Against Poverty (LEAP) in 2008. LEAP provides bimonthly cash payments ranging from 64-106 GHC to
8 extremely poor households with orphans and vulnerable children, elderly with no productive capacity,
9 persons with severe disability, and, starting in 2015, those with a pregnant woman or child under the age
10 of 12 months. As of December 2017, LEAP reached more than 213,000 extremely poor families in all 216
11 districts of Ghana. In a step towards better integration of social protection programming, the NHIA and
12 the MoGCSP collaborated in 2011 to enroll LEAP beneficiaries into NHIS, qualifying under the NHIA
13 “indigent” exemption which waives all NHIS fees, including those for card processing, premiums and
14 renewals.

15 In the current paper, we assessed the impact of the integration of cash and fee waivers in LEAP 1000 on
16 enrolment in the NHIS, hypothesizing that the income effect of the cash transfers paired with the fee
17 waiver would increase take-up.

18 METHODS

19 Study setting and design

20 Data come from the impact evaluation of the Ghana LEAP 1000 pilot program.⁽¹⁹⁾ This pilot added a
21 fourth eligibility category to Ghana’s LEAP program, namely that of poor families with pregnant women
22 (one eligible woman per household) or infants under one year old, aiming to reach poor children in the
23 first 1000 days of their lives to improve nutrition and development[†]. Now integrated into the LEAP
24 program nationally, LEAP 1000 was first piloted in ten districts in northern Ghana. Program participants

1 are informed about the NHIS fee waiver eligibility at the time of enrolment, and awareness campaigns are
2 periodically rolled out (including one during the study period). The longitudinal, mixed-methods
3 evaluation was carried out by UNICEF Office of Research – Innocenti, the University of North Carolina
4 at Chapel Hill (UNC-CH), the Institute of Statistical, Social and Economic Research (ISSER) of the
5 University of Ghana, and Navrongo Health Research Center (NHRC) and covered five of the original ten
6 LEAP 1000 pilot districts (Yendi, Karaga, East Mamprusi in the Northern Region and Bongo and Garu
7 Tempane in the Upper East Region). These districts were purposively selected to reflect demographic
8 diversity in the pilot. To identify a comparison group, the evaluation exploited the program eligibility
9 score (proxy means test, PMT) used in the targeting phase (March to July 2015) to identify eligible
10 participants and collected data only on those households close to the cut-off for maximum comparability.
11 This allowed for a regression discontinuity design which focuses on observations near the cut-off, also
12 referred to as local randomization.⁽²⁰⁾ We examined the satisfaction of RDD-related assumptions: first,
13 the threshold for program eligibility was determined by the government after PMT data was collected and
14 based on the budget available, ensuring exogeneity of the cut-off point. Second, the distribution of the
15 score around the cut-off did not show any discontinuity, indicating lack of manipulation of scores by
16 participants to qualify for the programme. Third, the distribution of household characteristics and
17 outcomes relative to the score at baseline had no discontinuity at the cut-off point and were statistically
18 balanced. More details on the study design and baseline balance of household characteristics between
19 study arms can be found in the baseline evaluation reportⁱⁱ.⁽²¹⁾
20 The PMT includes assets, dwelling characteristics, household size, etc. Households falling below the cut-
21 off, those classified as extremely poor by the PMT, were enrolled in the program. The study was powered
22 to detect program impacts on child health and nutrition outcomes, with an estimated required sample size
23 of 2,500 households, half from the comparison group (above the PMT cut-off) and half from the treatment
24 group (below the PMT cut-off). The baseline survey was conducted in July-September 2015 with 2,497
25 women that were pregnant at the time of the targeting exercise or had a child under 15 months of age. Of

these households, 2,331 were re-interviewed at endline (implemented between June and August 2017). LEAP 1000 payments commenced in September 2015. This panel design is justified over a cross-sectional design, as no new beneficiaries were added after baseline. At endline we found high level of compliance in the treatment group (88.3%). Thus, we focus on Intention-to-Treat (ITT) estimates. For robustness, we also examine ATT, and results were very similar.

The qualitative component of the evaluation included in-depth interviews a cohort of 20 beneficiary women from the treatment arm at baseline, 12 and 24-months' follow-up. Male partners of beneficiaries were interviewed during the 12 and 24-month follow-up visits. The purposive sample of the embedded cohort focused on geographic location (remote v. closer to markets) and parity (first time mother vs women with 3+ children) to facilitate comparative analysis.

Ethics review and study registration

The quantitative component was reviewed by the Ethics Committee for the Humanities of the University of Ghana and the qualitative component by the Institutional Review Boards at UNC-CH and NHRC. The trial is registered in the International Initiative for Impact Evaluation's (3ie) Registry for International Development Impact Evaluations (RIDIE-STUDY-ID-55942496d53af).

Patient and Public Involvement statement

Patients were not involved in this study. The development of the initiative being evaluated, research questions and outcome measures were informed by a vulnerability analysis which indicated that marginalized populations eligible for premium fee waivers under the NHIS were often not enrolling in the scheme. Research findings from the larger impact evaluation were disseminated in March 2019 to national policymakers and stakeholders, including district welfare officers, who liaise directly with program participants.

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Measures

Primary outcomes included current and ever enrolment in NHIS. For household member aged five years and above, a series of questions were asked to the main survey respondent, including whether the individual was covered under any health insurance scheme (NHIS was a response option). Then respondents were asked if the individual had ever been enrolled in NHIS (endline only) and whether the individual currently had a valid NHIS card. Analyzing ever enrolment allowed us to further disaggregate those that were not enrolled at endline into those never enrolled and those previously enrolled but not currently holding a valid NHIS card at endline.

For those not enrolled, we examined reasons why, including premium was too expensive, respondent did not realize the card expired, travel time or related cost was too high, lack of awareness that card must be renewed annually, respondent had not been sick, waiting times at renewal location are too long, perceived poor quality of NHIS/preferred services not covered, NHIS office was closed, and other reasons.

Qualitative interviews elicited narratives of program impact within each household and context to facilitate interpretation, probing specifically on enrollment and renewal in NHIS. We used a semi-structured guide, audio-recorded and transcribed verbatim and translated all interviews. All interviewers and participants were matched on gender and local language preference.

Statistical analyses

Our analytic sample included individuals who were interviewed both at baseline and endline. We performed stratified analyses by age: children aged 5 to 15 years at baseline and older children and adults aged 16 years and above at baseline and thus aged 18 years and above by endline in order to understand whether impacts vary between children and adults, as households may prioritize enrolment of children.

Further, while the programme targeting and sampling criteria were based on pregnant women or women with a child under the age of 15 months, study data were collected on NHIS enrolment of all household members, and therefore we conduct our analysis at both the household and individual level, where the

latter includes all household members, not just those targeted by the program. This is justified because the NHIS fee waiver applies to all LEAP household members, not just the targeted individuals.

We examined balance among background characteristics and outcomes at baseline between treatment and comparison individuals. Then we investigated if attriters differed in background characteristics by treatment status (differential attrition), which could threaten internal validity and unbiasedness of our estimates.

Next, we conducted bivariate analyses to examine background characteristics associated with enrolment status, controlling for PMT score. Categories of enrolment in NHIS included: 1) currently enrolled, 2) currently not enrolled but previously enrolled (ever) and 3) never enrolled.

To estimate treatment impacts of LEAP 1000 on NHIS enrolment, we utilized a difference-in-differences (DID) approach as specified in equation 1.

$$Y_{ijt} = \beta_0 + \beta_1 P_{ij} + \beta_2 T_t + \beta_3 P_{ij} * T_t + \beta_4 X_{ijt} + \lambda_j + \varepsilon_{ijt} \quad (1)$$

Where Y_{ijt} is a binary variable indicating whether individual i residing in community j is enrolled in NHIS in year t . P_{ij} is a dummy indicator for individual's i participation into LEAP 1000, equal to 1 if his or her household is assigned to treatment and 0 otherwise. T_t is a time binary variable, set to 1 if the observation is from the endline survey, and to 0 if it is from the baseline. $P_{ij} * T_t$ is the interaction term between the program and time dummies. X_{ijt} includes a set of observed individual (gender, age and age squared in years) and household characteristics [age, gender and education (no formal education versus some education) of the household head; household size and PMT score]. The model also controls for community fixed effects, λ_j , to absorb unobserved-time invariant characteristics of communities. β_3 is the intent-to-treat (ITT) impact estimate. Standard errors were clustered at the community level. A key assumption in the DID estimation model is that treatment and comparison groups experience parallel trends over time. However, while this assumption cannot be tested in the current study due to a lack of

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31 availability of pre-baseline data) we expect the assumption to hold given the high level of similarity

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52 between treatment and comparison households (sampled from the same communities) at baseline.

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104 For the qualitative analysis, we first developed a longitudinal summary for each household, integrating

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125 women’s and men’s interviews when both were available, to capture the story of impact over time. We

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146 summarized patterns in enrollment and renewals across household members and coded for topics related

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167 to NHIS using Atlas.ti software.

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208 **RESULTS**

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2310 At baseline, data for 4,736 children and 6,865 adults were reported, while at endline 4,197 and 6,130 of

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2511 these children and adults, respectively, remained part of the sample households (11% overall attrition for

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2712 both age groups; Figure A1 and Table A1 in Appendix). Attrition rates were similar between study arms,

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2913 and attrition by background characteristics and outcomes did not vary between groups (Table A2 in

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3114 Appendix).

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3415 **[Table 1 approximately here]**

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3817 The child sample was 46.6 percent female, and average age was 8.9 years (SD=2.9), while the adult

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4018 sample was 56.3 percent female, and average age was 36.7 years (SD=15.2). Average household size

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4219 was 7.6 members (SD=3.0), and 6 percent of households had female heads. Further, 81.9 percent of heads

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4420 had no formal education (figures comprise averages calculated from values in Columns 2 and 5,

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4621 Appendix Table A2). Over the study period, NHIS enrolment increased among the treatment group from

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4822 37.4 percent to 46.6 percent and decreased among the comparison group from 37.3 percent to 33.3

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5023 percent (Figures 1 and 2).

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5324 **[Figures 1 and 2 approximately here]**

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In bivariate analyses (Table 1), characteristics positively associated with enrolment included younger age (current and ever), female (current and ever), higher head education levels (current and ever), female headship (current and ever), smaller households (current and ever), and Karaga district (ever). There were no differences in enrolment by extreme poverty status.

[Table 2 approximately here]

Among those previously enrolled but not currently enrolled at endline, the most commonly reported reasons were enrolment fee/premium was too expensive (75.32 percent; Table 2), not realizing card expired (11.36 percent), and travel time/travel cost was too high (9.28 percent). Qualitative interviews identified barriers to renewal including long wait times, competing demands with work, cost of transport, and poor road conditions. Cost was also a salient barrier, reflecting both extreme poverty as well as confusion about their NHIS fee exemption status. As a male participant in Bongo stated simply, *“That money (the transfer) is not even enough to register for the children and the woman.”*

Reasons for never enrolment were similar: 65.44 percent reported enrolment fee/premium too expensive, 14.94 percent report travel time/travel cost too high, and another commonly reported reason was waiting times (Table 2). Some participants described that the LEAP program had come to their house to take their cards for renewal, eliminating some of the aforementioned barriers. Others described using their LEAP cash transfer to pay for renewal and viewed LEAP as facilitating their enrolment or renewal due to the cash provided by the program.

[Table 3 approximately here]

Qualitative findings echoed the patterns from the quantitative analyses, with both women and men indicating that women and children were the priority for enrolment. While perceptions of NHIS benefits were generally positive, at baseline several discussed never having enrolled because they questioned the quality of the coverage in terms of types of services included and a perception that medication was not covered (despite the fact that NHIS does cover medications, in and outside of facilities at accredited

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1 chemists/pharmacies). There were additional concerns about the quality of care for people using NHIS
2 versus those paying for services, as reflected by a mother in Karaga at baseline,
3 *“Some people say when you visit the hospital with it the doctors don’t want to attend to you but if*
4 *you do not have one, that one they will attend to you. This is the reason why we aren’t interested*
5 *in it.”*

6 Notably, she was enrolled by the endline interview, reflecting the potential impact of the integrated
7 programming on improving acceptance and reducing enrolment barriers.
8 Impact estimates indicate that LEAP 1000 increased current NHIS enrolment by 14 (95% CI 7.83 –20.52)
9 and 15 (95% CI 10.63–18.46) percentage points for children and adults, respectively (Table 3, first two
10 columns). Further, LEAP 1000 increased the proportion of adults reporting having ever been enrolled by
11 7 (95% CI 0.97–12.80) percentage points (Table 3, last two columns). The impact on ever enrolment was
12 not significant for children.

13 Most participants reflected a positive experience or perceptions of NHIS as a way to save costs on health
14 care. Among those who had used NHIS, nearly all were satisfied and felt that having insurance had
15 helped them to save money when seeking healthcare. A mother in Karaga identified NHIS enrolment as a
16 major component of LEAP impact, which she further linked to overall poverty reduction,

17 *Now the LEAP 1000 has given us the chance to register for the NHIS and reduced the poverty*
18 *levels of mothers. It was a big problem for most mothers to get money and register for the NHIS*
19 *but now it is easy for all beneficiaries of the LEAP programme.*

20 This sentiment was echoed by other mothers who appreciated that being in LEAP had allowed them to
21 enroll and/or renew their families in NHIS and take better care of their family’s health. Some participants
22 discussed lack of medication and other supplies as a barrier to getting care even when you have insurance,
23 as reflected by a father in Bongo, *“You know the insurance, when we sent the child, they gave us a*
24 *prescription to buy medicine because there was no medicine in the hospital.”*

1 Some participants mentioned that in cases like this, they could use their LEAP money to purchase
2 medication, which helped to protect their children's health.

3 **DISCUSSION**

4
5 This study demonstrated that an integrated government social protection program pairing cash transfers
6 with fee waivers for national health insurance enrolment increased enrolment into NHIS among both
7 children and adults. Our findings contribute to the literature on "cash plus" programs by providing
8 evidence of the impact of integrating cash with a health insurance fee waiver to increase enrolment.
9 Virtually all studies to date on this topic have looked at impacts of cash only or conditional cash transfers
10 on morbidity and use of health facilities and have found limited impact, particularly on adult morbidity.⁽²⁾
11 Our findings highlight a potential pathway through which unconditional cash transfers may improve
12 health, namely by increasing insurance coverage, which could ultimately lead to increased access to
13 preventive and curative healthcare services.

14 While impacts on enrolment were significant, enrolment gaps remain, particularly for adults. The salience
15 of cost as a perceived barrier to enrolment both confirms existing research on the topic,^(13, 17) and possible
16 reasons for this finding may include insufficient communication or misunderstanding of the integration of
17 the fee waiver with LEAP. This finding may suggest the need to improve communication with program
18 participants and/or implementers to maximize the potential impact of this integration and protect against
19 beneficiaries using their transfer to purchase insurance. Additionally, even with the fee waiver, the annual
20 renewal requirement for NHIS can be difficult for poor families to comply with, often leading to
21 expiration of benefits, as highlighted in previous research.⁽¹⁵⁾ Such gaps demonstrate operational issues
22 within both programs that could be better streamlined to ensure that eligible households fully benefit from
23 both services. Extending the validity period for NHIS beyond one year for LEAP households, thereby
24 reducing the financial and time burden for annual renewal, is one recommendation. Also, while beyond
25 the scope of the current findings, linking of data systems may be helpful, allowing field officers to track

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1 enrolment and validity along with their routine monitoring. Finally, better orientation could be provided
2 to the NHIA workers, ensuring that they do not mistakenly charge fees to exempt LEAP households.
3 One limitation of this study is that impact estimates are likely lower bounds of program impacts, given
4 the local average treatment impacts estimated among a sampled treatment group, which is relatively
5 “better off” than other LEAP households further from the eligibility cut-off. Another limitation is that at
6 baseline respondents were asked if they are enrolled in any insurance scheme, with NHIS as an option,
7 while at endline, they were specifically about NHIS enrolment in a separate question. However, we do not
8 believe this biases our impact estimates for two reasons. First, given the design, treatment and comparison
9 groups are very similar, therefore we expect the bias in the two groups to be very similar at each point in
10 time. Therefore, in a DID approach these biases cancel out. Second, we believe this bias to be small since
11 in practice NHIS is the only insurance available in these communities. At baseline, less than 0.2 per cent
12 reported having a different insurance. A third limitation is that we did not examine how distance to and
13 quality of health services might moderate programme impacts on enrolment. Finally, qualitative
14 interviews did not cover implementers, which could have provided important insights on communication
15 related to fee waivers, reasons for perceived costs barriers, and implementers’ own understanding of the
16 fee waiver process.

17 Findings underscore the need to improve education among beneficiaries around the annual renewal
18 requirement and exemption from paying premiums. Our data do not allow further investigation as to why
19 respondents - who should be eligible for fee waivers - reported costs as a major barrier to enrolment, and
20 future research should examine this further. Such findings have implications for Ghana and other
21 countries looking to integrate their cash transfer programs with access to health services, which must be
22 done not only at policy level but also with practical implementation modalities for the end user.

23 Moreover, access to health insurance can help reduce barriers, but alone does not ensure access to
24 healthcare. Individuals can enroll but still face barriers to access related to distances to facilities, quality
25 of services offered, and attitudes of staff, among others. This study has demonstrated how integrated

1 programming can improve enrolment rates, but large gaps remain. Future research should investigate how
2 to promote continued enrolment, as well as how integrated cash plus programs can achieve impact on
3 health outcomes beyond access to care, including morbidity, mortality and mental health.

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ⁱ Infants under 15 months were accepted as eligible to avoid excluding children due to variations in quality of birth date data and/or the extended duration of the targeting process.

ⁱⁱ The success in the implementation of an RDD necessitates that 1) participants were not able to manipulate their PMT score, 2) the threshold is determined independently of the rating variable, and 3) no discontinuities are present other than the treatment status in baseline characteristics and outcomes.

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1 List of Figures

2 Figure 1. Proportion of children (5-17 years old) with valid NHIS card for the current year

3 Figure 2. Proportion of adults (18+ years old) with valid NHIS card for the current year

4 Figure A1. Flowchart of study sample

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**Table 1: Bivariate analyses of background characteristics by enrolment status, Ages 7-103 at
endline**

	Means of characteristics			P-value of difference		
	Never enrolled with NHIS	Ever enrolled but currently no valid NHIS	Currently valid NHIS	Col(1)- Col(2)	Col(1)- Col(3)	Col(2)- Col(3)
	(1)	(2)	(3)	(4)	(5)	(6)
Age	24.92	19.26	16.45	0.00	0.00	0.00
Female	0.40	0.53	0.56	0.00	0.00	0.00
Elder (Age>=70 years)	0.03	0.02	0.02	0.01	0.21	0.04
Female elder	0.02	0.01	0.01	0.15	0.74	0.19
Male elder	0.02	0.01	0.01	0.01	0.17	0.05
Household size	7.62	7.73	7.29	0.68	0.00	0.03
Educational level of head	2.40	3.81	4.31	0.00	0.14	0.00
Head no formal schooling	0.88	0.82	0.79	0.00	0.03	0.00
Head is female	0.04	0.06	0.08	0.03	0.01	0.00
Age of head	40.09	40.71	40.17	0.30	0.05	0.53
Poor	0.99	0.98	0.98	0.72	0.45	0.35
Extremely poor	0.91	0.89	0.89	0.20	0.84	0.16
Karaga district	0.40	0.21	0.12	0.00	0.01	0.00
Yendi district	0.10	0.19	0.16	0.00	0.21	0.06
Bongo district	0.07	0.12	0.19	0.00	0.00	0.00
Garu-Tempane district	0.09	0.18	0.13	0.00	0.01	0.06
N	8,378	8,035	11,695			

Source: Authors' analysis. Notes: Mean values represent unadjusted statistics. P-values in Columns 4,5,6 correspond to the coefficient on each enrolment group from a regression predicting each characteristic listed in the table controlling for PMT score. Standard errors clustered at the community level.

**Table 2: Reasons for not renewing/never having NHIS by treatment status, Ages 7-103 at
endline**

	All	Comparison	Treatment	P-value of diff.
Ever enrolled but no valid NHIS	41.54	44.65	38.77	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	75.32	80.34	70.14	0.00
Did not realized card expired	11.36	10.61	12.14	0.54
Travel time/cost too high	9.28	8.40	10.19	0.37
Not aware had to be renewed annually	6.77	6.22	7.34	0.31
Has not been sick	1.59	1.49	1.70	0.68
Waiting time at renewal too long	3.05	1.15	5.00	0.00
Poor quality care with NHIS - preferred services not covered	0.32	0.19	0.45	0.18
NHIS office closed	0.44	0.19	0.70	0.19
Other (card lost, no time, etc.)	0.25	0.19	0.32	0.22
<i>N</i>	6,336	3,215	3,121	
Never enrolled with NHIS	18.98	22.29	16.02	0.00
<i>N</i>	15,252	7,201	8,051	
Enrolment fee/premium too expensive	65.44	65.28	65.64	0.92
Travel time/cost too high	14.94	17.67	11.56	0.02
Waiting time at renewal too long	4.85	4.23	5.62	0.24
Poor quality care with NHIS - preferred services not covered	3.30	2.36	4.47	0.01
Don't understand NHIS	0.28	0.19	0.39	0.39
Other	10.84	10.14	11.71	0.41
<i>N</i>	2,905	1,607	1,298	

Source: Authors' analysis. Notes: P-values are reported from Wald tests on the equality of means of Treatment and Comparison for each variable. Standard errors are clustered at the community level.

Table 3: Impact estimates of Ghana LEAP 1000 on current NHIS enrolment and ever enrolment, by age groups

	DID impact on current NHIS enrolment		OLS impact on ever NHIS enrolment	
	Ages 7-17 years at baseline	Ages 18+ years at baseline	Ages 7-17 years at baseline	Ages 18+ years at baseline
DID (Treatment X Time)	0.14 (0.03)***	0.15 (0.02)***		
Treatment	-0.01 (0.03)	0.01 (0.03)	0.05 (0.03)	0.07 (0.03)**
Time	-0.14 (0.03)***	-0.05 (0.02)**		
Age	-0.01 (0.00)***	-0.00 (0.00)***	-0.01 (0.01)	-0.00 (0.00)***
Age squared	-0.00 (0.00)**	0.00 (0.00)***	0.00 (0.00)	0.00 (0.00)**
Female	0.00 (0.01)	0.20 (0.01)***	-0.00 (0.01)	0.20 (0.01)***
PMT score	-0.02 (0.18)	0.21 (0.15)	-0.01 (0.16)	0.22 (0.18)
Household size	-0.00 (0.00)	-0.00 (0.00)*	-0.00 (0.00)	0.00 (0.00)
Head is female	-0.08 (0.03)***	-0.03 (0.02)	-0.01 (0.02)	-0.06 (0.02)**
Age of head	-0.00 (0.00)	0.00 (0.00)***	-0.00 (0.00)	0.00 (0.00)*
Head no formal schooling	-0.05 (0.03)*	-0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)
R ²	0.14	0.13	0.25	0.23
N	8,394	12,260	4,192	6,130
Baseline means	0.449	0.323		
Endline comparison means	0.311	0.276	0.832	0.746

Source: Authors' analysis. Notes: All regressions include the following covariates at baseline: Age, dummy for female (0,1), household head's age, dummy for having no formal education (0,1), dummy for women household head (0,1), PMT score, household size; community fixed effects. Impact from difference-in-difference estimates; impact on ever NHIS enrolment from single difference estimates. Analysis restricted to a panel sample. Standard errors in parenthesis clustered at the community level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$.

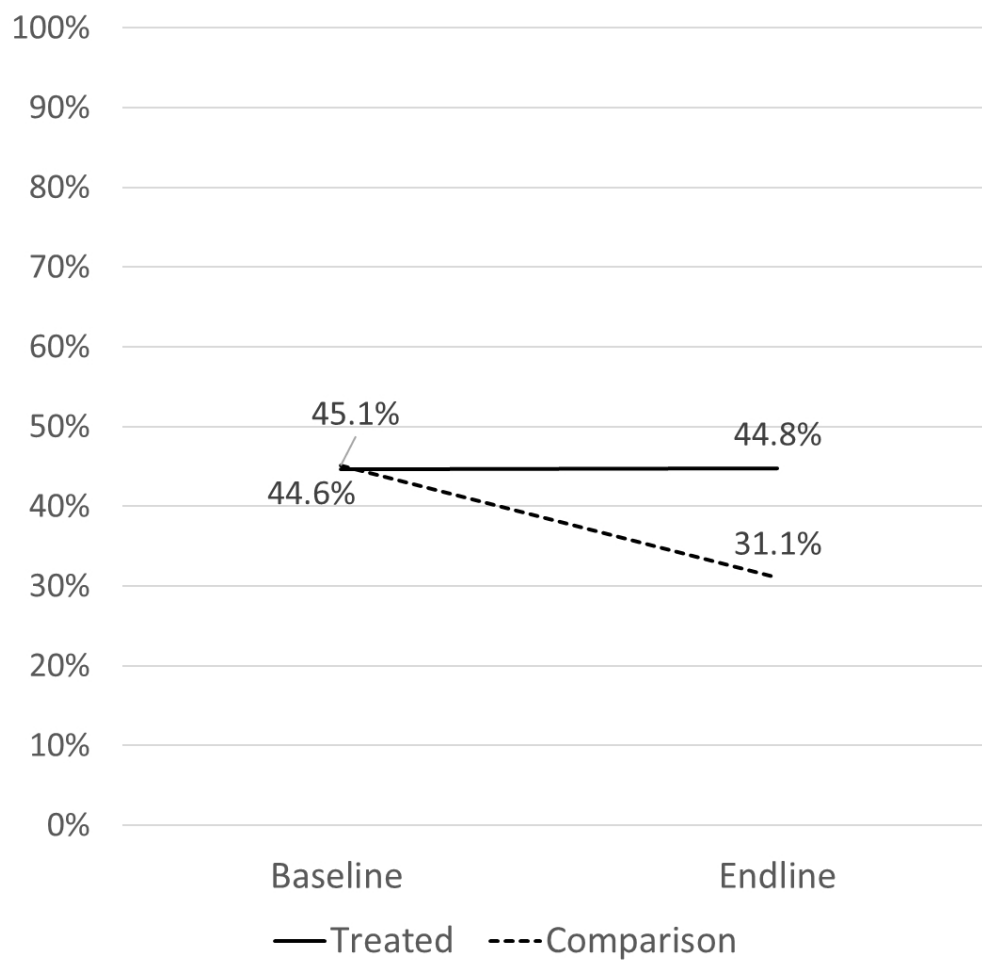


Figure 1. Proportion of children (5-17 years old) with valid NHIS card for the current year

90x90mm (300 x 300 DPI)

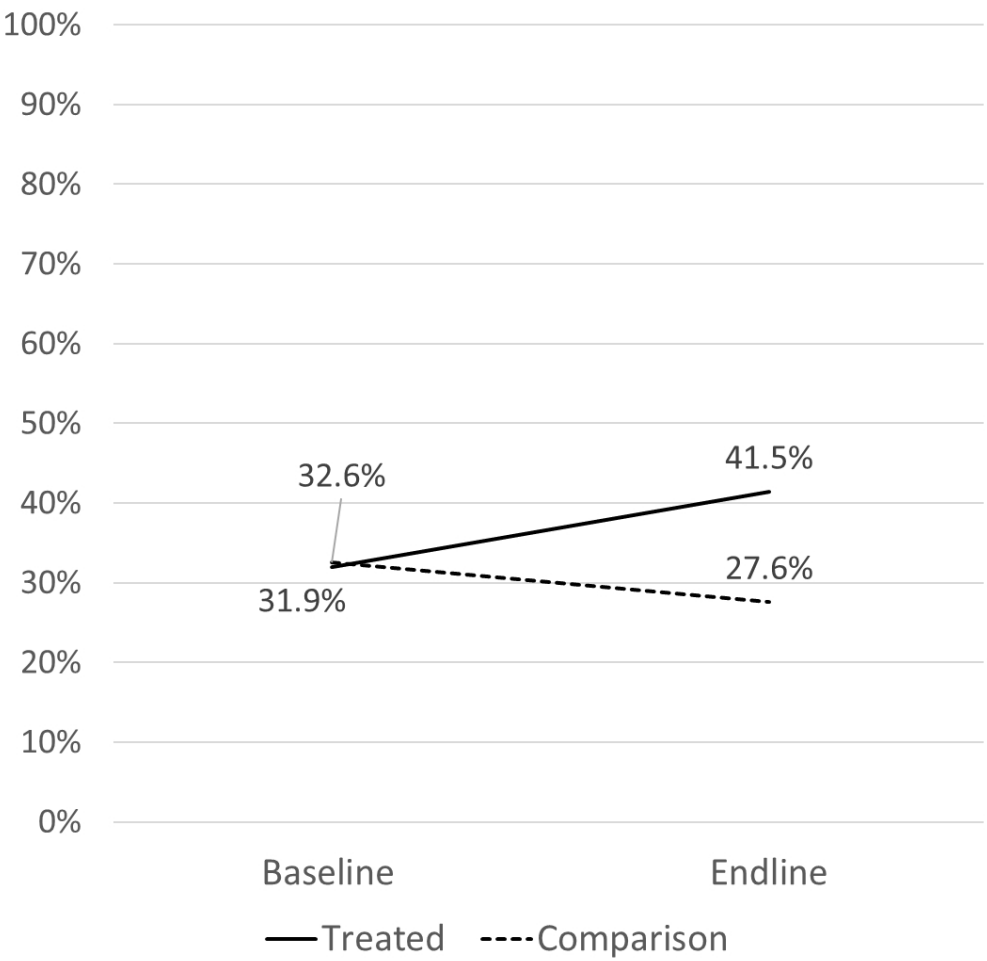


Figure 2. Proportion of adults (18+ years old) with valid NHIS card for the current year
90x90mm (300 x 300 DPI)

Appendices

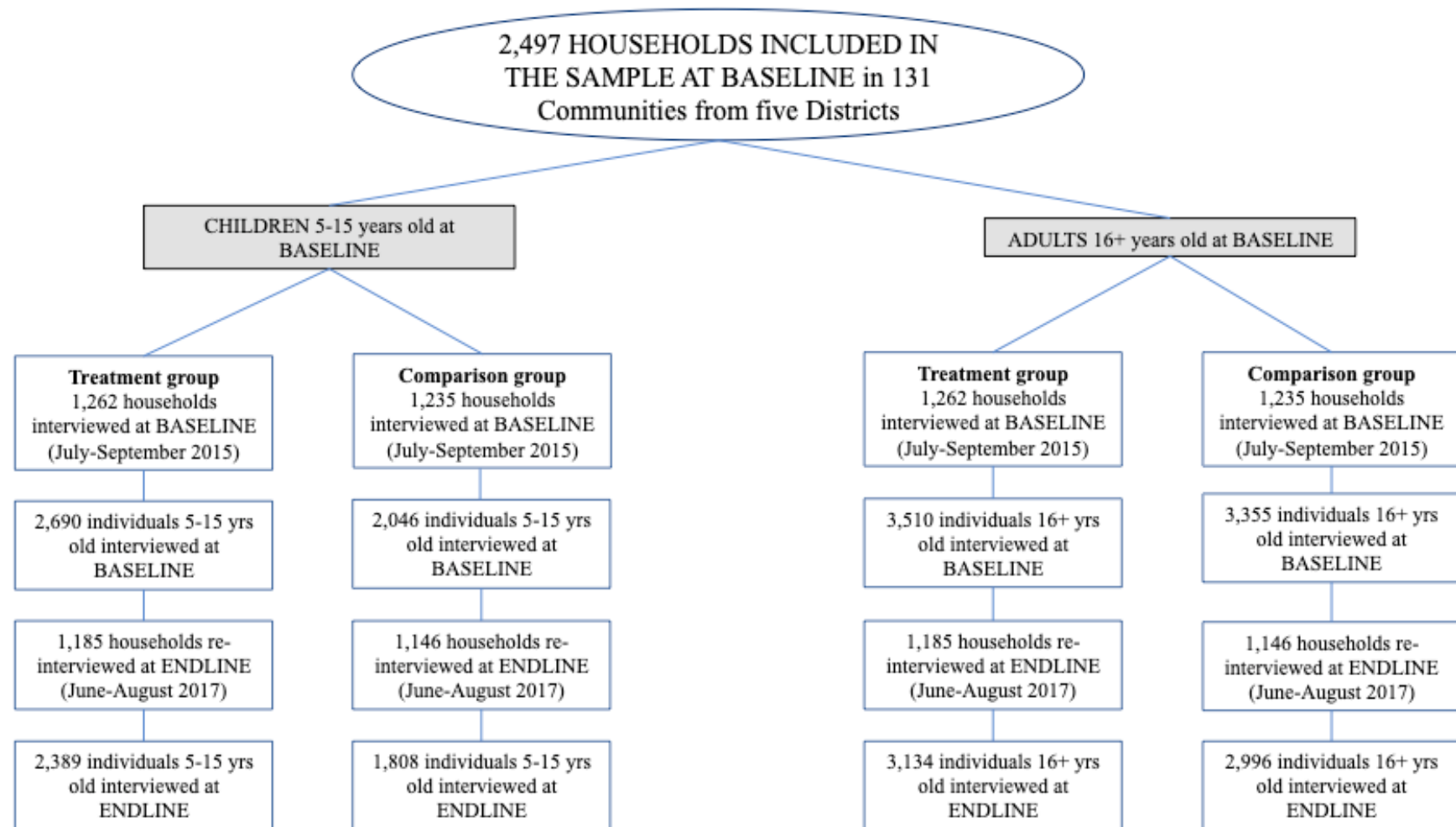


Figure A1. Flowchart of Study Sample

Table A1: Attrition by treatment status and age group

	N	All	Comparison	Treatment	P-value of diff.
<i>Individuals aged 5-15 years at baseline</i>					
Attrition rate	4,736	0.11	0.12	0.11	0.755
<i>Individuals aged 16+ at baseline</i>					
Attrition rate	6,865	0.11	0.11	0.11	0.989

T-test based on standard errors clustered at the community level.

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Table A2: Individual differential attrition (from baseline to endline) by baseline characteristics

	Attritors	Control Panel	P-value	Attritors	Treatment Panel	P-value	Difference Col(1)-Col(4)	P-value	Balance Col(2)-Col(5)	P-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Individuals aged 5-15 years at baseline										
<i>Background characteristics</i>										
Age (years)	9.90	8.83	0.000	10.00	8.93	0.000	-0.52	0.428	0.01	0.966
Age squared	108.46	87.04	0.000	110.51	88.51	0.000	-10.83	0.424	-0.32	0.925
Female (0,1)	0.62	0.46	0.000	0.56	0.47	0.003	-0.03	0.730	-0.01	0.828
Household size	9.42	8.01	0.000	10.13	8.44	0.000	-0.14	0.881	0.29	0.461
Head is female (0,1)	0.07	0.06	0.583	0.04	0.07	0.009	0.00	0.987	0.05	0.039
Age of head (years)	43.66	41.76	0.077	45.47	42.69	0.021	2.10	0.435	-0.79	0.448
Head no formal schooling (0,1)	0.85	0.84	0.818	0.90	0.85	0.035	-0.07	0.257	0.03	0.486
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.37	0.45	0.014	0.30	0.45	0.001	0.10	0.186	0.01	0.836
N	238	1,808		301	2,389					
Individuals aged 16+ at baseline										
<i>Background characteristics</i>										
Age (years)	36.31	36.06	0.834	35.67	37.30	0.247	1.49	0.632	-0.11	0.871
Age squared	1,713.16	1,528.12	0.107	1,676.83	1,626.01	0.716	147.23	0.621	-11.17	0.863
Female (0,1)	0.54	0.56	0.454	0.56	0.56	0.957	0.05	0.375	0.01	0.311
Household size	8.43	6.88	0.000	9.31	7.57	0.000	0.11	0.887	0.32	0.184
Head is female (0,1)	0.08	0.05	0.135	0.07	0.07	0.740	-0.01	0.771	0.04	0.037
Age of head (years)	42.77	38.50	0.001	44.95	41.12	0.001	-3.71	0.163	0.32	0.754
Head no formal schooling (0,1)	0.75	0.78	0.379	0.81	0.82	0.776	-0.13	0.109	0.05	0.189
<i>Outcome</i>										
Has valid NHIS insurance for current year (0,1)	0.26	0.33	0.016	0.21	0.32	0.000	0.05	0.459	0.03	0.259
N	359	2,996		376	3,134					

Mean values represent unadjusted statistics. P-values in Column 8 are from the coefficient on treatment from a regression predicting each characteristic listed in the table controlling for PMT score, among the group of attritors, while Column 10 is the same among the panel sample. Standard errors clustered at the community level.

CHEERS checklist—Items to include when reporting economic evaluations of health interventions

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as “cost-effectiveness analysis”, and describe the interventions compared.	page 1, line 1 to 2
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	page 3, line 1 to 24
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study.	page 5, line 12 to 14
		Present the study question and its relevance for health policy or practice decisions.	page 8, line 15 to 17
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	page 8, line 21 to page 9, line 12; Table 1
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	page 9, lines 5 to 10
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	P8, line 7; P7, lines 5-7
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	Page 8, line 5 to 14
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	Page 9, lines 24 to P10, line 2
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	N/a
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	Page 10, lines 23 to P11, line 13
Measurement of effectiveness	11a	<i>Single study-based estimates:</i> Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	Page 12, line 1 to 15; P9, lines 8-19
	11b	<i>Synthesis-based estimates:</i> Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	N/a
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	N/a
Estimating resources and costs	13a	<i>Single study-based economic evaluation:</i> Describe approaches used to estimate resource use associated with the alternative interventions. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	N/a
	13b	<i>Model-based economic evaluation:</i> Describe approaches and data sources used to estimate	Page 12, line 1 to 15; P9, lines 8-19

Section/item	Item No	Recommendation	Reported on page No/ line No
		resource use associated with model health states. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	
Currency, price date, and conversion	14	Report the dates of the estimated resource quantities and unit costs. Describe methods for adjusting estimated unit costs to the year of reported costs if necessary. Describe methods for converting costs into a common currency base and the exchange rate.	N/a
Choice of model	15	Describe and give reasons for the specific type of decision-analytical model used. Providing a figure to show model structure is strongly recommended.	Page 11, lines 18-21; P12, lines 1 to 13
Assumptions	16	Describe all structural or other assumptions underpinning the decision-analytical model.	Page 9, lines 12 to 19; Page 12, lines 11 to 15;
Analytical methods	17	Describe all analytical methods supporting the evaluation. This could include methods for dealing with skewed, missing, or censored data; extrapolation methods; methods for pooling data; approaches to validate or make adjustments (such as half cycle corrections) to a model; and methods for handling population heterogeneity and uncertainty.	Page 11, line 18 to 24; to Page 12, lines 1 to 11
Study parameters	18	Report the values, ranges, references, and, if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	Tables 1-3
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	N/a
Characterising uncertainty	20a	<i>Single study-based economic evaluation:</i> Describe the effects of sampling uncertainty for the estimated incremental cost and incremental effectiveness parameters, together with the impact of methodological assumptions (such as discount rate, study perspective).	N/a
	20b	<i>Model-based economic evaluation:</i> Describe the effects on the results of uncertainty for all input parameters, and uncertainty related to the structure of the model and assumptions.	Standard errors of point estimates reported in Table 3
Characterising heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	N/a
Discussion			
Study findings, limitations, generalisability, and current knowledge	22	Summarise key study findings and describe how they support the conclusions reached. Discuss limitations and the generalisability of the findings and how the findings fit with current knowledge.	Page 15, lines 19 to 21; Page 16, lines 17 to 19
Other			
Source of funding	23	Describe how the study was funded and the role of	Page 3, lines 27 to 30

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Section/item	Item No	Recommendation	Reported on page No/ line No
		the funder in the identification, design, conduct, and reporting of the analysis. Describe other non-monetary sources of support.	
Conflicts of interest	24	Describe any potential for conflict of interest of study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors recommendations.	No conflicts of interest reported
For consistency, the CHEERS statement checklist format is based on the format of the CONSORT statement checklist			